

To: Matthew J Betenson[mbetenso@blm.gov]
From: Staszak, Cynthia
Sent: 2017-08-29T17:43:07-04:00
Importance: Normal
Subject: Also contains research references...just not TWS list that was in NPCA doc
Received: 2017-08-29T20:06:04-04:00
Grand Staircase Escalante Partners DOI National Monument Review Comment (DOI-2017-0002-0001).pdf

And includes list from Sec Memo

Cindy Staszak
Monument Manager
Grand Staircase-Escalante National Monument
669 S. Hwy 89-A
Kanab, UT 84741
Office: 435 644-1240
Cell: 435 691-4340
Fax: 435 644-1250



**GRAND STAIRCASE
ESCALANTE
PARTNERS**

*Committed to
preserving and
protecting the vast
landscape of Grand
Staircase-Escalante
National Monument
for the use and
enjoyment of present
and future
generations*

Board Leadership
President
Noel Poe

Vice President
Thomas Hoyt

Secretary
Mike Satter

Treasurer
Jim Page

Board Members
Scott Berry
Dean Brooks
Rich Csenge
Gael Hill
John Holland
Tana McTeer
Sage Sorenson
Larry Spanne

Advisory Council
Barbara Camick,
Marie Coultier
Jan Gillespie, Ph.D.
Curtis Oberhansley
Sandra Vavrek

Executive Director
Nicole Croft

310 S. 100 E. # 7
PO Box 53
Kanab, UT 84741
(435) 644-2724
www.gsnm.org

July 7, 2017

Docket ID No. DOI-2017-0002-0001
Monument Review, MS-1530
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240
(submitted via hand-delivery and regulations.gov)

**Grand Staircase Escalante Partners Comments on the U.S.
Department of the Interior's 2017 Review of Certain National
Monuments Established Since 1996**

This comment is submitted by Grand Staircase Escalante Partners (*"the Partners"*) regarding the Grand Staircase Escalante National Monument (the *"Monument," "Grand Staircase," "GSENM,"* or *"Grand Staircase-Escalante"*) as part of the Secretary's review pursuant to Executive Order 13792 of April 26, 2017. While we do not believe that the President retains authority under the Antiquities Act of 1906 (the *"Act"*) to rescind the designation of the Monument or to effect any changes to its boundaries and submit these comments with objections, and thus question the underlying legal legitimacy of this review, the Partners is nonetheless providing comments to ensure that the Secretary's and the President's further considerations are based on a full, accurate, and fair record.

The Partners are uniquely well positioned to understand the Monument and the on-going compelling justification for its existence, as well as its impact on the communities who live and work in its region. The Partners serves as the official friends organization to the Bureau of Land Management (*"BLM"*) in its administration of the Monument. Among our activities on behalf of the Monument, we:

- i. carry out extensive student education programs, including through a curriculum-based education program that helps students, teachers, and people of all ages explore GSENM and the public lands and rural communities of southern Utah and northern Arizona;
- ii. manage lab and field work for the Monument's world-class paleontology program, catalog the paleontology collections, train and coordinate the volunteers, and educate the public regarding this program;
- iii. design and coordinate the Site Steward Program to inspect archaeological sites for signs of damage caused by natural erosion, animal activity, looting, or vandalism;
- iv. support the BLM in restoration of damaged sites; and
- v. are a central participant in the largest ecosystem restoration program in the region—and the largest riparian restoration project in BLM history—the Escalante River Watershed Project, which also helps to

secure and contribute extensive outside financial resources to the operation and management of the Monument.

The Monument is a truly special place that continues to be deserving of protection. Encompassing one of the last places to be mapped in the continental United States, GSENM spans nearly 1.9 million acres across three distinct regions in southern Utah: the Grand Staircase of multihued cliffs and terraces, the layer-cake treasure trove of the Kaiparowits Plateau, and the otherworldly canyons of the Escalante River watershed. Woven throughout are centuries-old Native cultures, small towns, and ranches founded by Mormon pioneers, and an increasing number of adventurers drawn to “America’s Outback.” The Monument is also one of the most fossil-rich places in the world. Hundreds of dinosaur, invertebrate, and plant species have been discovered in the past two decades alone including many ground-breaking discoveries and it remains the epicenter of significant research activities by more than a dozen esteemed academic institutions. Indeed, only a small portion of this remarkable fossil record has yet been explored. Likewise, the region abounds in archaeological resources left behind by three distinct cultures that occupied all of what is now Grand Staircase-Escalante National Monument,¹ and there have been numerous important discoveries since the Monument’s initial designation.

As will be described more fully in this Comment, the designation of GSENM continues to fall squarely within the “requirements and original objectives” of the Act and strikes a fully appropriate balance between “the protection of landmarks, structures, and objects” and “the appropriate use of Federal lands and the effects on surrounding lands and communities.”²

These comments provide input on:

- i. the limited nature of the Congressional grant of authority to the President, which is solely for Monument designation consistent with the Act’s protection purposes and lacks concomitant authority for the President himself to alter or rescind that designation;
- ii. the basis for the original designation of GSENM and its consistency with the objectives of the Act, including the protection of “historic landmarks, historic and prehistoric structures, [or] other objects of historic or scientific interest” and the continuing wisdom and urgency of those protections;
- iii. the consistency of the original designation, as well as its continuing consistency, with “the smallest area compatible with the proper care and management of the objects to be protected” provision; and
- iv. the significant economic and quality of life benefits that have accrued to the surrounding communities as a result of the Monument over its lifetime, greatly diversifying and strengthening local economic opportunities.³

There thus can be no legitimate or legal basis for rescinding the designation for this Monument or for changing its boundaries.

¹ The Fremont culture in the Escalante Canyons, the Kayenta Anasazi culture in the Kaiparowits Plateau region, and the Virgin Anasazi culture in the Grand Staircase area.

² 82 FR 20429 (May 1, 2017).

³ See generally *id.* at 20429–30 (May 1, 2017).

I. Introduction

The Monument, as currently configured, resulted from sustained, generations-long efforts to advance the protection of southern Utah, a region rich in historic, prehistoric, and scientific resources. In the 1930s, the Escalante National Monument was proposed, which would have protected an area that includes a large part of the current Monument. Entry into World War II placed a temporary hold on efforts to permanently protect these precious and finite resources. Subsequently, Utahns, and Americans more broadly, engaged in extensive efforts to protect the region. The Grand Staircase-Escalante region, long recognized as one of the crown jewels in America's public lands, was finally protected by designation on September 18, 1996.

As we note, it is beyond the President's limited Antiquities Act authority to undertake to determine whether Grand Staircase-Escalante continues to satisfy the purposes of the Act or if the land should be put to a different use. That determination is left to Congress. Accordingly, the President possesses no power to reduce or revoke monuments, either explicitly or implicitly. For the President to step in to reduce the Monument's boundaries would usurp the Congressional prerogative embedded in the Act and is a gross invasion of Congress's Constitutionally granted plenary power over federal lands.

In addition, aside from the President's general lack of authority under the Antiquities Act to revoke or reduce monuments, the President's authority has been further circumscribed here. After the Monument's creation, Congress modified the Monument boundaries on several occasions and thereby explicitly ratified it. Moreover, a federal court has upheld the Monument as entirely valid and subsequent courts have delved into management issues at the Monument. These judicial decisions strongly corroborate the conclusion that the boundaries are set and the President retains no power to reduce them.

Finally, assuming that the President had such authority, there would be no reasonable basis for the President to reduce or revoke the Monument. At the time of the Monument's creation, the area within the boundaries qualified for monument status. Additionally, the area within the boundaries continues to meet the requirements of the Antiquities Act and the original bases for protection have only grown stronger. Further, the Monument has generated substantial additional benefits for the surrounding communities, researchers, recreationalists, and travelers. It has become a vital part of the productivity of the surrounding communities. Critically, the Monument is as small as it can be to protect the resources it seeks to protect. Thus, any reduction in the Monument's size by the President would be unjustified and arbitrary, as would any change to its status.

II. The President Possesses No General Power to Eliminate or Alter the Boundaries of Duly Created Monuments

The President lacks legal authority to reduce or eliminate monuments, including Grand Staircase. The text of the Act does not provide him with such power and he possesses no implied power to do so. Ultimately, given that the Property Clause of the Constitution grants plenary power over federal land to Congress,⁴ any monument reduction would need to be

⁴ U.S. Const. art. IV, § 3, cl. 2.

accomplished by Congressional act. Any such attempt by the President to eliminate the Monument or reduce its boundaries would be an *ultra vires* exercise of authority and a usurpation of powers explicitly committed to Congress.

A. The President Lacks Statutory Authority to Revoke Monument Designations or to Reduce Their Boundaries

The plain meaning of the Act only provides the President with the power to create Monuments. The text of the Act grants the President authority to “declare” certain entities national monuments and “reserve” land for such monuments, subject to certain conditions. The text does not grant the President power to either revoke or reduce monuments. There is no ambiguity about this. Nor is the “smallest area compatible” language a grant of power—it is simply a condition on the clear reservation power. It is something the Act requires the President to follow when he is reserving land.

The purpose of the Act confirms that the President lacks any revocation or reduction power. The Antiquities Act had a long history prior to final passage of the statute, and this history reveals that the Act was aimed at providing permanent protection for certain resources. In response to the increased looting and degradation of various sites in the Southwest, including historic sites (such as Mesa Verde) and scientific sites (such as the Petrified Forest), the inability of the General Land Office to permanently protect such sites, and the glacial pace at which Congress moved to protect these sites on an individual basis, various interested parties began lobbying Congress to create a more expeditious method of affording permanent protection to outstanding sites.⁵ Unlike earlier approaches, the Antiquities Act was designed to allow the President to act quickly to protect eligible locations, thus avoiding Congressional delays, and it provided for permanent protection, thus allowing for more robust action than the executive branch had yet been able to pursue.⁶ A modification or revocation power is inconsistent with this purpose.

Congress was plainly aware of how to articulate clearly revocation and reduction powers. Beyond the Act itself, contemporaneous statutes provide strong support for the position that the President lacks revocation or reduction powers. Numerous federal land statutes from the late 19th and early 20th Century explicitly state that the President has reduction and revocation powers with regard to certain categories of federal land.⁷

Furthermore, the Federal Land Policy and Management Act of 1976 (“FLPMA”),⁸ which overhauled numerous aspects of federal land law, including the President’s withdrawal and reservation powers,⁹ did not repeal the Act, even though it repealed most other sources of

⁵ See Ronald Freeman Lee, *The Antiquities Act of 1906*, 42 J. Southwest 198, 198–247 (2000) (providing a history of the Act and events leading to its creation).

⁶ See, e.g., H.R. Rep. No. 59-2224, at 2–3, 7–8 (Mar. 12, 1906) (indicating that the purpose of the Antiquities Act and the legislative attempts leading to it was to provide a means of permanent protection).

⁷ See, e.g., Act of June 4, 1897, ch. 2 § 1, 30 Stat. 11, 34, 36; Act of June 17, 1902, ch. 1093 § 3, 32 Stat. 388, 388–89.

⁸ Pub. L. No. 94-579, 90 Stat. 2743 (1976) (codified as amended at 43 U.S.C. §§ 1701, *et seq.*).

⁹ See FLPMA §§ 201–214.

withdrawal authority.¹⁰ This failure to repeal in conjunction with the structure and text of FLPMA's broader overhaul of the Executive Branch's withdrawal power strongly indicates that the Act does not grant a revocation or reduction power and that such power lies solely with Congress.

Judicial decisions indicate that the "smallest area compatible" language is not a separate grant of power. While courts have not considered the full scope of the President's powers under the Antiquities Act, case law indicates that the "smallest area compatible" language simply conditions the reservation power. It does not, in other words, impose an on-going obligation to monitor monument boundaries or otherwise grant the President power to reduce or revoke monuments. For example, in *Utah Association of Counties v. Bush*,¹¹ while examining the President's power under the Act and attempting to determine if the President acted *ultra vires* in designating Grand Staircase-Escalante National Monument, the district court stated that the Act "offers two principles to guide the President in making a designation under the Act[:]" the types of resources eligible for monument status and the "smallest area compatible" language.¹²

In addition, Executive Branch analysis of the Antiquities Act confirms this limited reading of the Act's authority. The Department of Justice determined that the President lacks the power to revoke monument designations under the terms of the Act.¹³ Additionally, the Solicitor of the Interior has found that the President lacks the power to reduce monuments.¹⁴

B. The President Lacks Implied Authority to Reduce or Revoke Monuments

Any argument that the President possesses some degree of implied power to reduce or revoke Grand Staircase-Escalante National Monument must contend with the Property Clause of the Constitution. Article IV, section 3, clause 2 explicitly provides Congress with ultimate power over federal land decisions.¹⁵ As such, any implied power claim on the part of the Executive needs to be carefully circumscribed so as not to violate the separation of powers enshrined in the Constitution. Given the specificity with which the Constitution grants federal land power to Congress, there needs to be substantial evidence that Congress has delegated particular powers to the President. The available evidence cuts in the other direction: FLPMA and a number of Attorney General opinions strongly indicate that the President lacks implied authority in this sphere.¹⁶

¹⁰ See *id.* §§ 7 01–707; H.R. Rep. No. 94-1163, 9 (1976).

¹¹ 316 F. Supp. 2d 1172 (D. Utah 2004)

¹² *Id.* at 1183–86.

¹³ Proposed Abolishment of Castle Pinckney National Monument, 39 Op. Att'y. Gen. 185 (1938).

¹⁴ See Opinion of June 3, 1924, M-1205, M-12529.

¹⁵ The Property Clause reads "[t]he Congress shall have power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States[.]" See also *Kleppe v. New Mexico*, 426 U.S. 529, 539 (1976).

¹⁶ See, e.g., Rock Island Military Reservation, 10 Op. Att'y. Gen. 359 (1862); Disposition of Abandoned Lighthouse Sites, 32 Op. Att'y. Gen. 488 (1921).

Some have argued that past monument reductions by the President are proof that the President retains such power. This contention implicates a form of Congressional acquiescence: because the President took these actions, and Congress did not stop him, they must be authorized. Such an argument once had purchase with regard to federal lands under *United States v. Midwest Oil*.¹⁷ The principle of Congressional acquiescence enshrined in that case, however, has since been repealed by FLPMA.¹⁸ Moreover, no executive reductions or revocations have been attempted since FLPMA. Thus, the past practice argument has no foundation.

III. Post-Designation Congressional and Judicial Actions Make Clear that the President Does Not Possess the Power to Eliminate or Reduce the Boundaries of Grand Staircase-Escalante National Monument

Setting aside the issue of whether the Antiquities Act imbued the President with a general power to reduce or revoke national monuments, it is clear that he does not now have the power to do either at Grand Staircase because of post-designation Congressional and judicial actions. Put simply, post-Proclamation legislative and judicial activity in the 1990s and 2000s have ratified the very existence, as well as the borders, of the Monument.

Congress has modified the boundaries of Grand Staircase-Escalante National Monument on several occasions. First, in 1998 Congress ratified an agreement between the State of Utah and the Secretary of the Interior involving the exchange of Utah school trust lands.¹⁹ As part of this, the state exchanged “approximately 176,698.63 acres of land and the mineral interest in approximately an additional 24,000 acres” that were “within the exterior boundaries of the Monument” for federal land outside the Monument boundaries.²⁰ The school trust lands were distributed throughout the Monument in a roughly even fashion, as can be seen in the attached map. The agreement specifically stated that any lands acquired by the United States “within the exterior boundaries of the Monument . . . shall become a part of the Grand Staircase-Escalante National Monument, and shall be subject to all the laws and regulations applicable to the Monument.”²¹ Thus, the lands became a permanent part of the Monument. These trades were pursued because it was difficult for Utah to use or develop its land fully within the Monument’s boundaries. In order to allow for Utah to see an economic benefit from its land, the federal government traded land that more readily lent itself to development in exchange for the state’s inholdings.

Moreover, in addition to the land swap, the legislation also provided Utah with \$50 million in order to ensure that it received compensation for the lands taken out of production by the Monument.²² This exchange has proven to be a boon to the state: in 2017, the chief legal

¹⁷ See generally 236 U.S. 459 (1915).

¹⁸ See FLPMA § 7 04(a).

¹⁹ Utah Schools and Lands Exchange Act, Pub. L. No. 105-335, § 3, 112 Stat. 3139, 3141 (1998).

²⁰ Agreement to Exchange Utah School Trust Lands between the State of Utah and the United States of America § 2.

²¹ *Id.* at § 5.

²² Utah Schools and Lands Exchange Act § 7.

counsel for the Utah School and Institutional Trust Lands Administration stated that the “land exchange that was completed in 1998 has . . . had a great result for the school trust.”²³ This is borne out by the numbers as well. As of April 2017, “those lands have produced nearly \$341 million for the state.”²⁴ This is in addition to the benefits that the Monument continues to provide and that are detailed below. The President does not have the ability to unwind this arrangement. The federal government compensated Utah for the state’s land within the Monument and provided additional cash. The state of Utah believed that the agreement was fair and signed it. It was ratified by Congress. Reducing or revoking the Monument would be tantamount to unilaterally nullifying this bilateral agreement between the state and the federal government.

Congress also adjusted the boundaries of the Monument in 1998 by both removing and adding land.²⁵ In doing so, the statute explicitly references “[t]he boundaries of the Grand Staircase-Escalante National Monument.” In 2009, Congress removed a parcel of land from the Monument and stated “that the boundaries of the Grand Staircase-Escalante National Monument in the State of Utah are hereby modified to exclude the Federal land conveyed to Turnabout Ranch.”²⁶ Finally, and perhaps most critically, Congress legislatively established the National Landscape Conservation System (“NLCS”) in 2009, of which GSENM was a founding member.²⁷ In doing so, the legislation explicitly included the Monument with its then-present boundaries in the NLCS: “[t]he system shall include each of the following areas administered by the Bureau of Land Management: (1) Each area that is designated as (A) a national monument[.]”²⁸ There is strong authority establishing that continued Congressional action with regard to executive branch activity on federal land can constitute Congressional ratification of such activity, which bars the exercise of power over such land by non-Congressional actors.²⁹ Thus, by explicitly recognizing the boundaries of the Monument and adjusting them, Congress has ratified the boundaries of the Monument and has ensured that only it can change those boundaries. Just as the President plainly would not have the authority to unilaterally overturn an act of Congress, except through his Constitutionally recognized and highly procedurally constrained veto power, so too does he not have authority to take matters into his own hands where Congress has taken specific action ratifying or adjusting a prior Monument designation.³⁰

²³ Jennifer Yachnin, *National Monuments: Utah Land Swaps Could Foil a Trump Bid to Strip Protection*, E&ENews (May 2, 2017), <https://www.eenews.net/stories/1060053899>.

²⁴ *Id.*

²⁵ Act of November 6, 1998, Pub. L. No. 105-355, §§ 201–202, 112 Stat. 3247, 3252–53 (1998).

²⁶ Omnibus Public Land Management Act, Pub. L. No. 111-11, § 2604, 123 Stat. 991, 1119–18 (2009).

²⁷ Pub. L. No. 111-11, at §§ 2001–02, 123 Stat. at 1094–96.

²⁸ Pub. L. No. 111-11, at § 2002, 123 Stat. at 1095–96.

²⁹ *See, e.g., Idaho v. United States*, 533 U.S. 262 (2001) (finding that Congress had ratified tribal ownership of submerged lands granted to the tribe by executive order and that such ratification stopped Idaho from asserting sovereignty over the land); *United States v. Georgia-Pacific Co.*, 421 F.2d 92 (9th Cir. 1970).

³⁰ This argument is offered as an adjunct to, not a substitute for, our broader assertion that Congress has never provided the President with those authorities.

Beyond the legislature, the judiciary has also had the opportunity to examine the boundaries of Grand Staircase-Escalante National Monument and did not find issue with them. In *Utah Association of Counties*, the District Court of Utah examined whether the President “was in fact exercising the authority conferred by the [Antiquities Act.]”³¹ In making this inquiry, the court looked specifically at whether the President designated an appropriate location and whether the monument was “confined to the smallest area compatible with the proper care and management of the objects to be protected.”³² The court found that the Proclamation establishing the monument:

speaks in detail of the Monument’s natural and archaeological resources and indicates that the designated area is the smallest consistent with the protection of those resources. The language of the Proclamation clearly indicates that the President considered the principles that Congress required him to consider: he used his discretion in designating objects of scientific or historic value, and used his discretion in setting aside the smallest area necessary to protect those objects.³³

The court also rejected an argument strung together from scattered pieces of legislative history suggesting that monuments need to be small and protect man-made objects, and noted that the Supreme Court had forcefully rejected such contentions based on the plain language of the Antiquities Act.³⁴ Continuing this judicial affirmation of the Monument, other courts have examined various issues arising from management of the Monument, such as grazing allotments, water rights, and rights-of-way.³⁵ Taken together, *Utah Association of Counties* and subsequent Monument management cases indicate that the Monument’s size is proper and that all the land in the Monument is appropriate for inclusion under the terms of the Antiquities Act. In upholding the bases for the Monument, this decision should constrain any subsequent executive action regarding the Monument’s boundaries. It would trespass on the court’s decision for a President to say that the Monument is too large or otherwise contains ineligible locations—the decision affirms both those aspects of the Monument. Such Presidential action constitutes an invasion of the judicial realm and, at the very least, to bear any level of rationality, the President should have to explain why that court’s considered opinion was somehow flawed.

IV. There Is No Factual or Legal Basis for Reducing or Revoking Grand Staircase-Escalante National Monument

The Antiquities Act imposes three conditions that must be satisfied for the President properly to exercise his authority. First, monuments must protect “historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest.”³⁶ Second, such

³¹ *Utah Ass’n of Counties*, 316 F. Supp. 2d. at 1186.

³² *Id.*

³³ *Id.*

³⁴ *Id.* at 1186 n.8.

³⁵ See, e.g., *Stewart v. United States Dep’t of the Interior*, 554 F.3d 1236 (10th Cir. 2009) (involving grazing permits); *The Wilderness Society v. Kane County*, 632 F.3d 1162 (10th Cir. 2011) (involving rights-of-way issues); *Kane County Utah v. Salazar*, 562 F.3d 1077 (10th Cir. 2009) (involving rights-of-way and water rights).

³⁶ 54 U.S.C. § 320301(a).

landmarks, structures, or objects must be “situated on land owned or controlled by the Federal Government.”³⁷ Third, when created, the size of the parcels reserved for the monument must be “confined to the smallest area compatible with the proper care and management of the objects to be protected.”³⁸ The President is authorized to declare monuments and reserve land meeting such conditions.³⁹ The 1996 Proclamation establishing the Monument under the Antiquities Act unquestionably satisfied all of these conditions (and, as discussed below, continues to do so).⁴⁰ As such, there is no basis for withdrawing the designation or any reduction of the Monument’s boundaries.

A. The Area Covered by the Monument Plainly Contained Resources Eligible for Monument Status at the Time of the Proclamation

The Act requires that the resources eligible for monument status be “situated” on federal land.⁴¹ Moreover, the parcels of land subject to reservation are reserved “as part of the national monuments.”⁴² The Act protects eligible resources by protecting the land that encompasses such resources. Thus, whether a place is eligible for reservation by the President depends on whether that land encompasses resources included on the list of resources a President is authorized to declare as monuments.

This list is broad and a wide variety of locations have been found eligible for protection under the Act. In particular, courts have accepted capacious readings of “objects of historic or scientific interest.” Immense canyons,⁴³ endangered fish,⁴⁴ mountain-fronting land,⁴⁵ and historic sites from the early days of the United States⁴⁶ have all been upheld as within the ambit of that phrase. This broad interpretation comports with the Act’s plain language and legislative history. The plain breadth of the “scientific interest” provision thus implicates a wide variety of locations that encompass far more than man-made or miniscule items.⁴⁷

In the case of Grand Staircase-Escalante National Monument, the Proclamation lists numerous resources that are clearly “objects of historic or scientific interest.” The list of objects, which is appended to these comments, is extensive. Geological, paleontological, historic, and prehistoric resources are enumerated in detail. For example, the Proclamation identifies “[a]

³⁷ *Id.*

³⁸ 54 U.S.C. § 320301(b).

³⁹ 54 U.S.C. § 320301(a).

⁴⁰ See Proclamation 6920, 110 Stat. 4561, 4561 (1996).

⁴¹ 54 U.S.C. § 320301(a).

⁴² 54 U.S.C. § 320301(b).

⁴³ See *Cameron v. United States*, 252 U.S. 450 (1920) (upholding the designation of Grand Canyon National Monument).

⁴⁴ See *Cappaert v. United States*, 426 U.S. 128 (1976).

⁴⁵ See *Wyoming v. Franke*, 58 F. Supp. 890 (D. Wyo. 1945).

⁴⁶ See *id.*

⁴⁷ See, e.g., *Cameron*, 252 U.S. at 450; *Cappaert*, 426 U.S. at 128.

wide variety of formations, some in brilliant colors, [that] have been exposed by millennia of erosion,” “[n]aturally burning coal seams [that] have scorched the tops of the Burning Hills brick-red,” the East Kaibab Monocline, the Circle Cliffs, the Waterpocket Fold, the Escalante Natural Bridge, and the Grosvenor Arch (a “rare ‘double arch’”).⁴⁸ The Proclamation also speaks in depth about the “world class paleontological sites” contained in the monument petrified wood, numerous fossils, and other unique preserved resources.⁴⁹ The Proclamation identifies protection of the rich human history of the Monument and specifically enumerates the objects and buildings left behind by the Anasazi and Fremont cultures, the Southern Paiute and Navajo tribes, and Mormon pioneers.⁵⁰ Finally, the Proclamation is premised on the plethora of biological resources, which are undoubtedly of scientific interest, that can be found within the Monument’s boundaries.⁵¹ The Monument has a long and rich history as the locus for numerous types of scientific research.⁵²

Celebrated monuments have been sustained based on far less. Devils Tower, the first national monument, was created to protect a single geologic formation.⁵³ Montezuma Castle and El Morro, the second and third monuments, were created to protect archaeological and historic sites.⁵⁴ Petrified Forest National Monument was created to protect the eponymous petrified wood.⁵⁵ Dinosaur National Monument was created to protect fossil deposits.⁵⁶ Glacier Bay National Monument was created to protect flora and fauna, as well as glaciers.⁵⁷

⁴⁸ 110 Stat., at 4561–62.

⁴⁹ *Id.* at 4562.

⁵⁰ *Id.*

⁵¹ *Id.* at 4563.

⁵² See Duncan Metcalfe, *An Archaeological Assessment*, in VISIONS OF THE GRAND STAIRCASE-ESCALANTE: EXAMINING UTAH’S NEWEST NATIONAL MONUMENT 31, 34–37 (Robert B. Keiter, Sarah B. George, and Joro Walker eds., 1998) (citing sources and discussing the history of archaeological research); Jayne Belnap, *The Biota and Ecology*, in VISIONS OF THE GRAND STAIRCASE-ESCALANTE: EXAMINING UTAH’S NEWEST NATIONAL MONUMENT, *supra* note 52, at 21, 21–30 (citing sources); David D. Gillette, *Paleontological Resources*, in VISIONS OF THE GRAND STAIRCASE-ESCALANTE: EXAMINING UTAH’S NEWEST NATIONAL MONUMENT, *supra* note 52, at 13, 15–17 (discussing the history of paleontological research). See, e.g., See James H. Gunnerson, *Archaeological Survey of the Kaiparowits Plateau*, 39 U. Utah Anthropological Papers 319, 319–473 (1959); Don D. Fowler and C. Melvin Aikens, *1961 Excavations Kaiparowits Plateau*, 66 U. Utah Anthropological Papers iii, iii–100 (1963); Florence C. Lister, *Kaiparowits Plateau and Glen Canyon Prehistory: An Interpretation Based on Ceramics*, 71 U. Utah Anthropological Papers iii, iii–92 (1964).

⁵³ See Proclamation of Sept. 24, 1906, 34 Stat. 3236–35 (establishing Devils Tower National Monument).

⁵⁴ See Proclamation of Dec. 8, 1906, 34 Stat. 3265 (establishing Montezuma Castle National Monument); Proclamation of Dec. 8, 1906, 34 Stat. 3264 (establishing El Morro National Monument).

⁵⁵ See Proclamation of Dec. 8, 1906, 34 Stat. 3266 (1906) (establishing Petrified Forest National Monument).

⁵⁶ See Proclamation of Oct. 4, 1915, 39 Stat. 1752 (establishing Dinosaur National Monument).

⁵⁷ See Proclamation of Feb. 26, 1925, 43 Stat. 1988 (establishing Glacier Bay National Monument).

Nor have past monument declarations necessarily been of limited geographic scale. The Grand Canyon National Monument, which was over 800,000 acres, was created to protect the stunning geology of that span of the Colorado River.⁵⁸ Moreover, the Supreme Court specifically upheld the creation of the monument on that basis—its geologic richness was reason enough to sustain the monument.⁵⁹

In other words, each resource provided as a reason for creating Grand Staircase-Escalante National Monument has served as the sole basis for other, long-standing monuments, including immense ones. The geology of the Monument alone would be sufficient to sustain it, but the Monument contains an embarrassment of eligible resources, and the Proclamation and objects list go to great lengths to enumerate this inventory of qualifications.

Corroborating this analysis, the court in *Utah Association of Counties* upheld the designation of the Monument. Of particular note, it found that the resources enumerated by the Proclamation satisfied the requirements of the Antiquities Act.⁶⁰ Moreover, this is not simply a situation where the court found that the President had unlimited discretion to declare monuments and it simply could not examine the issue at all. On the contrary, the court explicitly acknowledged that the President's power to create monuments is conditional and that, although the President's discretion is great, the judiciary possesses a degree of review power over monument designations.⁶¹ Nonetheless, the court upheld the designation.⁶²

B. The Area Covered by the Monument Constituted Lands Owned or Controlled by the Federal Government at the Time of the Proclamation

The location of Grand Staircase-Escalante National Monument satisfies the requirements of the Antiquities Act. The Act requires that all monuments be “situated on land owned or controlled by the Federal Government.”⁶³ The Act explicitly authorizes private entities to relinquish land containing eligible resources and allows the Secretary of the Interior to accept such tracts.⁶⁴

Prior to its creation, the bulk of the current Monument was land owned by the federal government and managed by the Bureau of Land Management. Certain parcels within the monument, however, were owned by Utah and managed by the state's School and Institutional Trust Lands Administration. As noted above, these lands were eventually transferred to the

⁵⁸ See Proclamation of Jan. 11, 1908, 35 Stat. 2175–76 (establishing Grand Canyon National Monument).

⁵⁹ See *Cameron*, 252 U.S. at 450.

⁶⁰ *Utah Ass'n of Counties*, 316 F. Supp. 2d at 1185–86.

⁶¹ See *id.*

⁶² See *id.*

⁶³ 54 U.S.C. § 320301(a).

⁶⁴ 54 U.S.C. § 320301(c).

federal government in 1998 and made part of the Monument by statute.⁶⁵ The Proclamation specifically states that the Monument comprises “all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the document entitled ‘Grand Staircase-Escalante National Monument’ attached to and forming a part of this proclamation.”⁶⁶ A map of the area is included with the Proclamation. This language clearly excludes any lands within the boundaries that were owned by non-federal entities at the time of the Monument’s creation.⁶⁷ There is thus no question that the Proclamation satisfied the federal lands requirement.

C. The Area Covered by the Monument Was the Smallest Area Compatible with Proper Care and Management at the Time of the Proclamation

The size of Grand Staircase-Escalante National Monument satisfies the requirements of the Antiquities Act. As a final condition of monument creation, the Act requires that “[t]he limits of the parcels shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.”⁶⁸ The plain language of the Act and its legislative history strongly indicate that this phrase does not involve any hard limitation on how large monuments can be. Instead, this language ties the size to the resources that the monument is intended to protect.

By its clear terms, the “smallest area compatible” language is a balanced standard. The use of the word “compatible” along with the phrase “proper care and management” indicates that the President must balance size against management when he designates monuments. More specifically, that the area needs to be “compatible” with “proper care and management” indicates that striving for the smallest size is not the overriding goal of the provision. There would have been far simpler constructions that accomplish this particular goal, such as stating that the area needs to be the “smallest size possible.” While some earlier drafts of the Act would have limited monuments to 320 or 640 acres, the final Act contains no numerical limitation. Instead, “compatible” indicates that size considerations need to be balanced against management considerations. Ensuring proper management may require (and often does require) a substantially greater area than that immediately surrounding the designated resources, and this language acknowledges that calculation.

Beyond this, however, there can be no question that the original reservation of approximately 1.7 million acres was an entirely appropriate set-aside given the resources that the Monument was intended to protect. The Monument seeks to protect numerous eligible resources more than, for example, the Grand Canyon or Katmai. Given this variety, it is entirely unsurprising that a large area was needed and such size was fully justified. Moreover, the way in which the Monument was structured in eventual consultation with the Utah

⁶⁵ See Agreement to Exchange Utah School Trust Lands between the State of Utah and the United States of America §§ 2, 5; Utah Schools and Lands Exchange Act, Pub. L. No. 105-335, § 3, 112 Stat. 3139, 3141 (1998).

⁶⁶ Proclamation 6920, 110 Stat. 4561, 4564 (1996).

⁶⁷ See *id.* at 4565.

⁶⁸ 54 U.S.C. § 320301(b).

Congressional delegation⁶⁹ demonstrates sensitivity to minimizing any adverse impacts.⁷⁰ Indeed, the Proclamation was far more “complete, exhaustive, and detailed” than any that had come before and directly addressed many of the concerns raised by Utah officials.⁷¹ This included the decision to seat Monument management with the Bureau of Land Management for the first time ever the continuation of grazing activities, and a disavowal of water rights. Moreover, this management decision eased the way for placing tourism-related commercial development (*e.g.*, lodging, campgrounds, gift shops, guides, and visitor centers) in adjacent communities, as contrasted with National Park System units, where such facilities are generally built in the unit and managed by concessioners. This was complemented by an extensive public process around the development of a comprehensive Monument management plan.

V. The Monument Continues to Satisfy All the Requirements of the Antiquities Act and Generates Substantial Additional Benefits

A. The Monument Continues to Protect Critical Resources Across its Entire Area

As noted in the Proclamation, the Monument “embraces a spectacular array of scientific and historic resources,” and encompasses the irreplaceable national treasures that the Antiquities Act was designed to protect.⁷² It has not ceased to do so since 1996 and, in fact, new instances of resources worthy of protection are continuously being discovered within the Monument.

Perhaps unsurprisingly, the geologic features of the Monument have not disappeared in the last 20 years. As noted, the geologic “Grand Staircase” vividly represents the tumultuous history of the planet, and includes incredibly diverse landscapes, including the serpentine Upper Escalante Canyons, the rugged Kaiparowits Plateau, the Circle Cliffs, the East Kaibab Monocline, and numerous arches and natural bridges. Tourists continue to come from all over the world to experience the breathtaking scenery of the Monument, and scientists vie for the opportunity to conduct research on this last frontier of the West.

The continued importance of the protections provided by the Monument and of its resources is demonstrated by the numerous opportunities the Monument continues to provide for unparalleled scientific research. In 2016 alone, 13 institutions conducted groundbreaking research in the Grand Staircase-Escalante National Monument, including the Denver Museum of Natural History, North Carolina Museum of Natural Sciences, Idaho State University,

⁶⁹ See John D. Leshy, *Putting the Antiquities Act in Perspective*, in *VISIONS OF THE GRAND STAIRCASE-ESCALANTE: EXAMINING UTAH’S NEWEST NATIONAL MONUMENT*, *supra* note 52, at 83, 87 (“[T]he president did not make his decision to move forward without talking to the governor, the congressional delegation, and other local interests. In fact, the president and his senior advisers, including Secretary of the Interior Babbitt, had a number of direct conversations with Utah officials during the days immediately preceding his decision. These conversations addressed both whether to go forward with the proclamation and its terms. They continued until very shortly—just hours—before the president made his decision.”).

⁷⁰ See *id.* (“[T]he substance of the proclamation reveals that most state and local concerns were addressed.”).

⁷¹ See *id.*

⁷² See Proclamation 6920, 110 Stat. 4561, 4561 (1996).

Midwestern University, Missouri Southern State University, Museum of Northern Arizona, Museum of Western Colorado, Natural History Museum of Utah, Raymond Alf Museum of Paleontology, Southern Connecticut State University, University of California Museum of Paleontology, University of Washington, and Weber State University. These researchers have come to the Monument primarily to study the “world-class paleontological sites” noted in the Proclamation. The bounty recovered from these sites has been featured in prominent media such as National Geographic Magazine, the New York Times, the Discovery Channel, the Travel Channel, and Europe’s ARTE TV.

The sedimentary rocks of the Grand Staircase hold an uninterrupted record of 25 million years of life, marine and terrestrial, and “contain[] one of the best and most continuous records of Late Cretaceous terrestrial life in the world.”⁷³ Shortly after the Monument’s creation, the Utah Department of Natural Resources published a preliminary inventory of paleontological resources within GSENM. The study noted that “[p]aleontological studies have been conducted within the boundaries of the monument and vicinity since the middle of the nineteenth century” and that “[t]he fossil record includes marine and terrestrial fossils that are critical for stratigraphic correlation, paleoenvironmental reconstructions, and study of the evolving faunas and floras.”⁷⁴ The report also noted that the Monument contains numerous paleontological resources that simply cannot be found elsewhere due to the unique conditions present in the Monument area in the distant past. For example, the study indicates that the “vertebrate fauna of the Kaiparowits Formation [in GSENM] is the most extensive Late Cretaceous biota in Utah, and one of the most important in North America.”⁷⁵ Nor are these resources concentrated in one particular area. As the state study noted, “[f]ossils occur broadly throughout the formations within the monument.”⁷⁶

In the 21 years since the Monument was created, 12 new species of dinosaurs have been discovered along the Kaiparowits Plateau alone, and only 4 % of the region has been inventoried. The sedimentary rocks also offer a remarkable faunal diversity, including the highest diversity of the iconic frilled herbivorous dinosaurs, called ceratopsians, worldwide from a single time period.⁷⁷ Discoveries include the oldest tyrannosaur, the oldest named ancestor of *Tyrannosaurus rex* (*Lythronax argestes*), and the oldest named ceratopsian (*Diabloceratops eatoni*), an old relative of the celebrated *Triceratops*.⁷⁸ Additionally, fossil preservation can be

⁷³ *Id.* at 4562.

⁷⁴ DAVID D. GILLETTE & MARTHA C. HAYDEN, UTAH GEOLOGICAL SURVEY, A PRELIMINARY INVENTORY OF PALEONTOLOGICAL RESOURCES WITHIN THE GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT, UTAH 7 (1997).

⁷⁵ *Id.* at 15.

⁷⁶ *Id.* at 8.

⁷⁷ See Alan L. Titus, Jeffrey G. Eaton & Joseph Sertich, *Late Cretaceous Stratigraphy and Vertebrate Faunas of the Markagunt, Paunsaugunt, and Kaiparowits Plateaus, Southern Utah*, 3 *Geology of the Intermountain West* 229, 229–91 (2016).

⁷⁸ See Mark A. Loewen, Andrew A. Farke, Scott D. Sampson, Michael A. Getty, Eric K. Lund & Patrick M. O’Connor, *Ceratopsid Dinosaurs from the Grand Staircase of Southern Utah*, AT THE TOP OF THE GRAND STAIRCASE: THE LATE CRETACEOUS OF SOUTHERN UTAH 488 (Alan L. Titus & Mark A. Loewen, (continued...))

exceptional, with dinosaur specimens exhibiting soft tissue preservation of skin, beaks, and claws.⁷⁹ A complete list of the dinosaurs discovered in the Kaiparowits and Wahweap Formations can be found in the Appendix (several species are still awaiting publication). There are also at least 6 ancient crocodile species, 17 turtle species, 27 taxa of snakes and lizards and at least 28 mammal genera from the Wahweap and Kaiparowits Formations. There are countless bony and cartilaginous fish taxa, and five species of marine reptiles (4 plesiosaurids, 1 pliosaurid, and 1 mosasaur). This bounty of resources supports robust research at the Monument's lab, which currently houses 3,908 elements, including 2,351 ammonites. Recent maps of these resources, attached hereto, indicate the enormous scale and intensity of the paleontology resource meriting protection.

"[O]utstanding biological resource[s]" remain another key feature of the Monument. Because of its remote location, the Monument continues to "present[] an extraordinary opportunity to study" the dynamic and unique biological features found in the region, which has significance and relevance for the entire Colorado Plateau and American Southwest.⁸⁰ The continuing biologic significance of the Monument and its contribution to our understanding of the fragile, yet resilient, desert ecology, is forcefully articulated in an assessment by ecologist Dr. Michael Scott:

The Monument is biologically diverse and not only contains a significant percentage of Utah's rare and endemic plant species, but a significant percentage of all the plants found in Utah. For example, of a total state-wide flora comprising approximately 2600 species, nearly 85% are found in the Monument (Shultz 1992). Biodiversity, or the number different species found within a habitat, is often used as an indicator of healthy plant communities, including forests and rangelands used by human communities. Endemic species or those found only in a specific region or area are also often rare and found in small, isolated populations and in specific habitats. These species are viewed as unique and important genetic resources and are therefore typically afforded protection at the state, federal or international level.

Within the Monument, habitats with the highest diversity of species are spatially and geographically distinct from habitats supporting most rare and endemic species. Based on a sampling of vegetation from 367 large plots across the Monument, Stohlgren et al. (2005) showed that high elevation aspen forests, or forests along perennial streams, growing under moist, high nutrient soil conditions, generally had the greatest number of species. In contrast, rare species or species endemic to Utah or the Colorado Plateau, were primarily found in low elevation, desert habitats with droughty, low nutrient and sometimes salty soils. Moisture limitations and islands of unique, fine-textured and drought-prone soils appear to drive physiological specialization for drought tolerance, which in turn may be a primary factor in the formation of new and endemic plant species (Shultz 1992). Utah has one of the highest rates of plant endemism in

eds. 2013); Mark A. Loewen, Randall B. Irmis, Joseph J.W. Sertich, Philip J. Currie, & Scott D. Sampson, *Tyrant Dinosaur Evolution Tracks the Rise and Fall of Late Cretaceous Oceans*, 8 PLoS One 1 (2013).

⁷⁹ See Titus, et. al., *supra* note 77.

⁸⁰ See Proclamation 6920, 110 Stat. 4561, 4563 (1996).

North America and nearly 10% of the Utah flora, more than 200 species, are endemic. Approximately 50% of these species are found within the Monument (Shultz, 1992; Belknap 1999). That the majority of Utah's endemic plants are found in desert environments is interesting, since it is sometimes assumed that habitats with the greatest diversity of species also contain the greatest number of rare and endemic species (Stohlgren et al. 2005).

Plant and landscape diversity drive diversity in other groups of organisms. More than 650 bee species are now described from the Monument; the richest bee landscape reported to date. For comparison, there are only about 200 bee species reported for all of New England (<http://www.nativebeesofnewengland.com/>). Such pollinator diversity is attributable to a broad range of elevations within the Monument along with corresponding shifts in landscape types from forests to shrublands to grasslands. Also related to this diversity is a rich diversity of flowering plants, including some with limited distributions and specific pollinator requirements (Messinger 2006). Similarly, the diversity of aquatic invertebrates in the Monument is consistently higher, up to three times more species, than in other locations across the Colorado Plateau. Reasons for this relate to the diversity of physical conditions within and across aquatic habitats found within the Monument. These habitats include: streams; perennial wetlands; tinajas (pools formed in bedrock); alcove pools (formed below high cliff pour-offs); and hanging gardens (formed where ground water exits cliff walls). Streams and tinajas in particular, displayed a wide array of flow conditions and water temperatures. Aquatic invertebrate diversity also reflects the fact that although the Monument is contained within the Colorado Plateau, species representative of the Great Basin and the Mojave Desert regions are found here. Finally, some taxa or groups of invertebrates reflecting Neotropical affinities, likely represent relicts from more moderate climate regimes of the past (Vinson and Dinger 2008).

...

In short, the Monument continues to protect numerous biological resources and, in doing so, continues to preserve the "objects of [] scientific interest" upon which it was founded. This protection facilitates broad-scale, applied research on a variety of issues, including improved rangeland management and sustainability, and allows for critical research focused on assessing rangeland health and identifying factors critical to managing and restoring sustainable rangeland ecosystems.⁸¹

The area encompassed by GSENM has also been a well-known source of archaeological resources for decades and remains so to this day. A 1997 preliminary inventory published by the Utah Department of Natural Resources noted that archaeology performed within the Monument boundaries in the early 20th Century had been critical to advancing our understanding of cultures in the region: "[t]he work of Neil Judd and others in and near the monument in the 1920s helped to define what today we know as the prehistoric Anasazi Culture, while the

⁸¹ Memorandum from Dr. Michael Scott, Researcher, Escalante River Watershed Project to Nicole Croft, Executive Director, Grand Staircase Escalante Partners (Feb. 24, 2017).

Fremont Culture was not even recognized as a separate entity until Noel Morss first described it in 1931 after conducting research along the northern margin of the monument.”⁸² Similarly, studies published in the 1950s and 1960s explored the wealth of sites present on the Kaiparowits Plateau in more depth.⁸³ Studies from this period also corroborate the Monument’s continuing importance as a meeting place for several ancient cultures.⁸⁴

Despite this early work, the 1997 preliminary inventory indicated that much remained unknown: “more than 100,000 archaeological sites may exist within the monument as a whole, but only a very small fraction of these has been documented.”⁸⁵ Known sites represented a variety of human activity, ranging “from small lithic scatters of chipped stone debris, representing only brief visits, to large, visually impressive masonry village sites on the Kaiparowits Plateau and in the canyons of the Escalante River drainage.”⁸⁶

The domestication and utilization of turkeys is widely documented throughout the Colorado Plateau. Evidence of turkey pens and elaborate feather blankets and robes can be found across the Four Corners region. The reigning assumption has been that turkeys, much like corn, beans and squash, also migrated through trade routes from Central America. However, a Paleoarchic site in the Grand Staircase-Escalante National Monument has now provided researchers with evidence of a wild ancestor of the turkey, and these flocks may have been the source of turkeys used during the era of the Ancestral Puebloans, raising intriguing questions about our understanding of cultural migration and trade patterns.⁸⁷

Sites within the Monument have also provided new understandings of the human experience in the period 950-1100 AD, illustrating more significant interaction than previously understood. Using ceramics, site plans, and architecture, migration and interaction patterns between Fremont, Kayenta Anasazi, and Virgin Anasazi cultures are beginning to be understood.

⁸² DAVID B. MADSEN, UTAH GEOLOGICAL SURVEY, A PRELIMINARY ASSESSMENT OF ARCHAEOLOGICAL RESOURCES WITHIN THE GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT, UTAH 6 (1997) (internal citations omitted).

⁸³ See James H. Gunnerson, *Archaeological Survey of the Kaiparowits Plateau*, 39 U. Utah Anthropological Papers 319, 319–473 (1959); Don D. Fowler and C. Melvin Aikens, *1961 Excavations Kaiparowits Plateau*, 66 U. Utah Anthropological Papers iii, iii–100 (1963). Maps from these studies demonstrating the wealth of sites on the Kaiparowits Plateau are included in the Appendix.

⁸⁴ See, e.g., Florence C. Lister, *Kaiparowits Plateau and Glen Canyon Prehistory: An Interpretation Based on Ceramics*, 71 U. Utah Anthropological Papers iii, iii–92 (1964). A map from this study illustrating the cultural crossover area is included in the Appendix. See also MADSEN, *supra* note 82, at 8 (noting that the transition between the Anasazi and Fremont cultures “lies almost entirely within the monument”).

⁸⁵ MADSEN, *supra* note 82, at 5.

⁸⁶ *Id.* at 3.

⁸⁷ See Bradley A. Newbold, Joel C. Janetski, Mark L. Bodily, & David T. Yoder, *Early Holocene Turkey (Meleagris gallopavo) Remains from Southern Utah: Implications for the Origins of the Puebloan Domestic Turkey*, LEARNING FROM THE LAND: SCIENCE SUMMARY, 2006-2016 4 (2016).

Questions are now being asked about the “possibility of intermarriage or trade alliances and the nature of co-habitation within the region.”⁸⁸

The long-recognized status of the Monument’s area as a meeting ground for three distinct cultures implicates a critical point: any attempt to carve up the Monument by removing portions of the Grand Staircase, by excising the lands of the Kaiparowits Plateau, or by undoing other portions would seriously undermine the ability to study how these cultures interacted with and influenced each other. For example, any reduction would put numerous archaeological resources at risk of destruction. More broadly, it would become much more difficult to understand these cultures and their interactions holistically. As Duncan Metcalfe, Curator of Archaeology and Chief Curator of the Natural History Museum of Utah, put it in his essay on the archaeology of the Monument: “[t]oday our interest is in patterns of prehistoric land use and how those changed through time and across space.”⁸⁹ The Monument’s complete area continues to protect not only numerous critical sites, but, just as importantly, it safeguards a fuller understanding of the cultures that occupied this land.

Research is being conducted in the Monument on unusual features known as cup and channel petroglyphs. These unique petroglyphs are exceptionally large, in some cases up to two meters long, can be found at prominent locations, and have long been a mystery waiting to be unraveled. Potential uses of these petroglyphs include navigation to water sources and seasonal markers, but scientists are just beginning to connect these features with “cultural affiliation and sociocultural function.”⁹⁰

The archaeology of the Monument offers incredible potential for understanding the very earliest human cultures from the Four Corners region. Interestingly, it can also be applied to our understanding of the landscape-scale management the Monument was designated to study. Researchers studying packrat middens have “clearly showed that winter and spring cattle grazing helped control invasive exotic red brome and cheatgrass . . . and it also diminishes native and exotic plant communities.” Archaeological work on the Grand Staircase has also reconstructed climate, fire, and vegetation patterns spanning back 7,300 years for Fiftymile Mountain and nearly 1,650 years for Johnson Canyon. These records document the impact of cattle grazing, help establish a baseline for natural fire and vegetation patterns, and have established the significant scientific and historic value for early agricultural archeological sites in these two areas of the Monument.

The Monument also continues to preserve human history and the stories of the cultures that sought to carve out a life in these remote lands: Paiute, Ute, Hopi, Zuni, and Navajo. There are over 20,000 known sensitive archeological sites on the Monument, but it is estimated that only 10 percent of the area has been thoroughly surveyed. It is anticipated that tens of thousands of additional unknown sites exist. The Monument also preserves resources from a particularly challenging era of Mormon history, including sites such as the Old Paria town-site,

⁸⁸ See Joel C. Janetski, Lane D. Richens & Richard K. Talbot, *Fremont-Anasazi Boundary Maintenance and Permeability in the Escalante Drainage*, LEARNING FROM THE LAND: SCIENCE SUMMARY, 2006-2016 2 (2016).

⁸⁹ See Metcalfe, *supra* note 52, at 32.

⁹⁰ Michael L. Terlep, *Water, Pitch, and Prehistoric Indexes: An Analysis of Cup and Channel Petroglyphs*, LEARNING FROM THE LAND: SCIENCE SUMMARY, 2006-2016 5 (2016).

rock houses, cowboy camps, Dance Hall Rock, and the famous Hole-in-the-Rock trail. The size of the Monument remains essential to protect the “wholeness” of the archeological and historic record. As recognized by the original Proclamation, reducing the area of the Monument would substantially impair this protection. Thus, there is not a reasonable basis for reduction or elimination of the Monument and any such action would be wholly arbitrary.

B. The Monument Continues to Generate Substantial Additional Benefits for the Surrounding Communities

Traditional land uses within the Monument have been maintained over time since its designation. Leased grazing rights for traditional land use have not been impacted by the Monument designation. 96.4 percent of the Monument remains open for grazing, and only 17 allotments are partially or entirely unavailable. In 1996, there were 77,400 Animal Unit Months (“AUMs”) and today the number of permitted AUMs is 76,957. Some grazing permits were relinquished voluntarily due to drought or, in some areas along the Escalante River, sold to the Grand Canyon Trust for higher than market value to protect the fragile riparian zone.⁹¹ The negligible difference in AUMs on the Monument today are entirely reflective of market forces and the devastating drought of the 2000s, and, moreover, by BLM’s own assessment, in line with grazing trends seen throughout the West. The Monument protects the cultural traditions of its earliest pioneer settlers, and provides an opportunity to understand best practices in landscape scale management and grazing.

The Monument is now deeply woven into the fabric of the communities that live at its doorstep. This was by design. Since the Monument’s designation, the surrounding communities in Kane and Garfield Counties have realized continuous and sizeable economic benefits, such as a greatly diversified economy, greater employment opportunities, improved property values, improved household income, and improved per capita income. Between 2001 and 2015, real personal income in the Monument region grew by 32 percent and real per capita income grew by 17 percent.⁹² Moreover, this growth is impressive within the context of the entire state: “Garfield County’s average annual real per capita personal income growth . . . surpassed Utah’s average throughout the 2000s (1.34% vs. 1.15%), and outperformed Utah’s average over the 6 year period of the last decade, 2010 to 2015 (2.86% vs. 2.15%).”⁹³ Behind the numbers, the Monument also continues to be a key part of the region’s culture as evidenced by the numerous festivals celebrating the community connections to the Monument, including the Boulder Heritage Festival, the Escalante Canyons Arts Festival, and the Amazing Earthfest in Kanab.

⁹¹ See Bureau of Land Management, *Grazing Background* (2017) (slide presentation); Phil Taylor, *Grazing in Clinton-era Monuments -- It’s Complicated*, E&E News (Apr. 18, 2016), <https://www.eenews.net/stories/1060035783>.

⁹² Headwaters Economics, *THE ECONOMIC IMPORTANCE OF NATIONAL MONUMENTS TO LOCAL COMMUNITIES: GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT FACT SHEET 1* (2017).

⁹³ Pacific Northwest Regional Economic Analysis Project, *GARFIELD COUNTY VS. UTAH COMPARATIVE TREND ANALYSIS: PER CAPITA PERSONAL INCOME GROWTH AND CHANGE, 1969-2015*, <https://utah.reaproject.org/analysis/comparative-trends-analysis/per-capita-personal-income/tools/490017/490000/> (last visited Jul. 6, 2017).

The Monument continues to draw people from all over the world who seek to enjoy the exquisite quality of life that living near this protected public land offers. According to the 2010 census, between 2000 and 2010, the West grew substantially faster than the Midwest or Northeast (13.8 percent vs. 3.9 and 3.2 percent).⁹⁴ Indeed, in the same period, Utah was the third fastest growing state in the country after two other western states (Nevada and Arizona). St. George, Utah, in the southwestern part of the state, was the second fastest growing metropolitan area in the country, and all the counties in Utah experienced population growth during this period, including Garfield and Kane Counties.⁹⁵

Retirees and others who intentionally seek to live in proximity to protected public lands appear to make up the majority of this migration. They are not just changing the demographics of these communities, they are changing the economies and bringing with them a different perspective about land management and preservation.⁹⁶ Whereas in the past, rural communities of the West depended on employment tied to the boom-and-bust cycle of extractive industries or time-limited reclamation projects like dams, jobs have been and continue to shift to a more sustainable, service-based economy.⁹⁷ According to a 2017 study, services jobs (*e.g.*, doctors and engineers) “account for the majority of employment growth in the Grand Staircase-Escalante Region in recent decades,” experiencing 42 percent growth from 2001 to 2015.⁹⁸ Indeed, the communities around the Monument have seen a flourishing of diverse, locally owned small businesses. Remarkably, there are now over 100 outfitters and guides with business operations tied to the Monument. Moreover, total employment in the Monument region has “experienced strong growth”: the population has grown by 13 percent between 2001 and 2015 and jobs have grown by 24 percent.⁹⁹ Critically, this growth has not come at the expense of traditional jobs in areas such as agriculture, mining, and timber: “[l]ong before the monument’s creation, commodity industries . . . were becoming a smaller share of the overall economy in the Grand Staircase-Escalante Region. These industries remain part of the region’s economy today.”¹⁰⁰ As the foregoing data demonstrates, by sustaining a healthy environment and protecting public lands that encourage relocation, the Monument continues to play an integral role in sustaining local communities and helping ensure continued prosperity.

⁹⁴ Paul Mackun and Steven Wilson, U.S. Census Bureau, *Population Distribution and Change: 2000 to 2010*, 2010 Census Briefs 1 (2011).

⁹⁵ *Id.* at 2–6.

⁹⁶ Headwaters Economics, *THE ECONOMIC IMPORTANCE OF NATIONAL MONUMENTS TO LOCAL COMMUNITIES: GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT FACT SHEET 2* (2017). *See also* Samuel M. Otterstrom & J. Matthew Shumway, *Deserts and Oases: The Continuing Concentration of Population in the American Mountain West*, 19 J. Rural Stud. 445, 445 (2003).

⁹⁷ Headwaters Economics, *THE ECONOMIC IMPORTANCE OF NATIONAL MONUMENTS TO LOCAL COMMUNITIES: GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT FACT SHEET 1* (2017); Otterstrom & Shumway, *supra* note 96, at 453–61.

⁹⁸ Headwaters Economics, *THE ECONOMIC IMPORTANCE OF NATIONAL MONUMENTS TO LOCAL COMMUNITIES: GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT FACT SHEET 1* (2017).

⁹⁹ *Id.*

¹⁰⁰ *Id.* at 2.

Critically, the Monument also provides rich educational benefits. Connecting the community with ground-breaking science and discoveries coming out of the Grand Staircase is an essential role of the Partners. Students K-12 across the gateway communities of the Monument have the opportunity to experience directly the science and cultural significance of the region as an integrated component of their education. They are provided opportunities to learn from experts and are introduced to new career paths that can enable them to remain in the communities they grew up in; a rarity in rural America in the 21st Century. They are also taught “respect and protect” principles that empower the next generation with good land stewardship principles.¹⁰¹

Further, the local communities continue to have a substantial voice in determining how the Monument is managed. In 1997, there were over 30 public workshops with over 2000 participants throughout 15 communities engaged in providing input about the early draft management plan. Since then, community input continues to be a paramount part of the process by which the Monument operates. For example, until suspended in May 2017, the Monument Advisory Committee met quarterly to solicit local input on management decisions. Similarly, public input is also sought on projects in the Monument subject to the National Environmental Policy Act.¹⁰²

Beyond continued preservation of the resources the Monument was created to protect, it generates numerous additional benefits, as amply demonstrated in the twenty years since its creation. For example, the Monument also continues to protect the traditional life ways of the Native American nations whose ancestors lived here by safeguarding and preserving springs and native plants, which are gathered for healing and ceremonial purposes. Additionally, the heritage of the Mormon community is preserved here, through the protection of traditional grazing against the encroachment of extractive industry.

VI. Conclusion

In sum, there is no basis for reducing or eliminating Grand Staircase-Escalante National Monument and any attempt to do so would bring harm to the communities. As a broad matter, the President has no power whatsoever—either derived from the text of the Antiquities Act or otherwise implied—to eliminate Grand Staircase-Escalante or to reduce its borders. That power is Congress’s alone. Moreover, even setting aside the issue of the President’s general authority, he has no power to reduce or revoke Grand Staircase-Escalante in particular. Post-Proclamation Congressional action, including the statutory establishment of the NLCS, has decisively ratified the Monument’s boundaries.

Beyond the question of Presidential authority, there is no factual or legal basis for reducing or revoking the Monument. The 1996 Proclamation establishing the Monument met all three criteria enumerated in the Antiquities Act: The Monument protected a plethora of eligible archaeological, paleontological, historic, and geologic resources; The Monument was

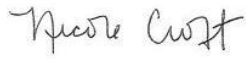
¹⁰¹ Indeed, this may contribute to the very low rate of vandalism the Monument enjoys. *See* M. Zweifel, *Human-Caused Impacts at GSENM Cultural Resource and Paleontological Sites, 2011-2016* (2016).

¹⁰² Pub. L. No. 91-100, 83 Stat. 852 (1969) (codified as amended at 42 U.S.C. §§ 4321, *et seq.*).

composed of federal land; and the Monument was the smallest area compatible with proper management of the aforementioned eligible resources. Critically, the size of the Monument was tailored to the protected resources and was no larger than necessary to ensure proper management of those resources. Nor has this changed in the years since the Proclamation. The Monument continues to hold the variety of historic, prehistoric, and scientific resources that motivated the original Proclamation. Indeed, if anything, subsequent research has revealed even more eligible resources with the Monument's boundaries.

Finally, it is essential to note that the Monument has generated substantial benefits for the surrounding communities. Employment opportunities, property values, real personal income, and per capita income have all improved in the wake of the Monument's creation. The Monument has allowed for the creation of numerous new businesses and related jobs, including a robust outdoor recreation and tourism economy. It also draws increasingly more tourists and is a key attraction for new residents. It is central to enhanced local educational opportunities. In essence, far from being the albatross that some Monument opponents like to claim it is, the Monument has acted as a powerful force for economic improvement and diversification, and has become a fixture of the surrounding communities. Any attempt to reduce or revoke Grand Staircase would only succeed in wreaking havoc on these communities and throwing their well-being into serious jeopardy.

Grand Staircase Escalante Partners

A handwritten signature in dark ink, appearing to read "Nicole Croft". The signature is written in a cursive, flowing style.

Nicole Croft
Executive Director

APPENDIX

- 1.** List of Identified Resources in Grand Staircase-Escalante National Monument in November 6, 1996 Letter from Secretary of the Interior Bruce Babbitt to Director, Bureau of Land Management
- 2.** The Dinosaurs of Grand Staircase-Escalante National Monument
- 3.** Grand Staircase-Escalante National Monument Bureau of Land Management Map of Potential Fossil Yield Categories
- 4.** Grand Staircase-Escalante National Monument Bureau of Land Management Map of Paleontological Sites
- 5.** Map of School and Institutional Trust Lands within Grand Staircase-Escalante National Monument Prior to 1998
- 6.** 1959 Map of Selected Archaeological Resources Located on the Kaiparowits Plateau
- 7.** 1961 Map of Selected Archaeological Resources Located on the Kaiparowits Plateau
- 8.** 1964 Map Illustrating Interaction of Fremont and Anasazi Cultures within the Monument Area

List of Identified Resources in Grand
Staircase-Escalante National Monument in
November 6, 1996 Letter from Secretary of
the Interior Bruce Babbitt to Director,
Bureau of Land Management

Grand Staircase - Escalante National Monument
List of Historic and Scientific Objects of Interest

Objects of Geologic Interest

Description: Perennial streams enter entrenched canyons in white Navajo and deep-red Windgate Sandstone. Deer Creek, Steep Creek, and The Gulch have perennial flows of clear cold water. The Gulch leads up into the spectacular Circle Cliffs where remarkable specimens of petrified wood (60 ft. logs) exist in the Morrison and Chinle formations.

Location: Escalante - Steep Creek WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: White Canyon cuts through the Kaibab Limestone to the Coconino Sandstone, the oldest stratum in the Upper Escalante drainage.

Location: Escalante - Studhorse Peaks unit

Source: Davidson, E.S., Geology of the Circle Cliffs Area, Garfield and Kane Counties, Utah, 1967. p. 10

Description: Big Spencer Flat Road and the V Road is site of "thunderball" iron concretions known as Moqui marbles. These oddities weather out of the Navaho sandstone and are a popular recreation feature.

Location: North Escalante Canyons WSA

Source: Sargent, K.A., Environmental Geologic Studies of the Kaiparowits Coal-Basin, Utah. p. 16, and Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Waterpocket Fold tops out at Deer Point (7,243 feet). Most of the Waterpocket Fold is in the Capitol Reef National Park where it is a major landmark.

Location: Escalante - Colt Mesa unit

Source: Utah Wilderness Coalition. Wilderness at the Edge. p. 189, and Davidson, E.S., Geology of the Circle Cliffs Area, Garfield and Kane Counties, Utah, 1967. p. 61

Description: The inner gorges of the upper Moody Canyons cut into the relatively harder Kaibab Limestone and Coconino Sandstone (oldest exposed layer in this region).

Location: Escalante - Colt Mesa unit

Source: Utah Wilderness Coalition. Wilderness at the Edge. p. 189

Description: Dry Valley Creek Canyon. A waterfall blocks the entrance to Dry Valley Creek Canyon and consequently, the canyon remains in its natural condition. A perennial stream cuts through alluvial benches. It is relict and probably possesses important scientific values.

Location: Mud Springs Canyon WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The East Kaibab Monocline or the Cockscomb is unique as a Colorado

Plateau structure. Its alignment with the Paunsaugant, Seevier, and Hurricane faults suggest that it too could be a fault at depth. It extends from the Colorado River north to Canaan Peak and is a major landmark.

Location: Kaiparowits Plateau - The Cockscomb WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Blues - a Cretaceous shale badlands, richly colored and contrasting with adjacent pink sandstone cliffs that forms a significant part of the vista for visitors to Bryce Canyon National Park. The Kaiparowits formation is well exposed here represents an accumulation of exceedingly rapid proportions and an immature sedimentary region which is not well displayed in any other formation in the Colorado Plateau.

Location: The Blues WSA (near Bryce Canyon)

Source: Welch, S.L., Rigby, J.K., Hamblin, W.K., A Survey of Natural Landmark Areas of the North Portion of the Colorado Plateau, 1980. p. 248

Description: Fiftymile Mountain is a complex of deep canyons, upwarps, monoclines, hogbacks and a spectacular 42-mile long Straight Cliffs wall, topping a thousand-foot-high cliffline of the Summerville, Morrison and Dakota formations. This complex marks the edge of the Kaiparowits Plateau.

Location: Kaiparowits Plateau - Fiftymile Mountain WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Ancient coal fires of Right Hand Collet Canyon have left surface remains in the form of clinkers and deep red ash. These remains dominate the visual character of the drainage.

Location: Carcass Canyon WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Arch. Span of 40 feet located in Calf Canyon, and is visible from the Alvey Wash road.

Location: Carcass Canyon WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Burning Hills - naturally occurring underground coal fires have turned steep and rugged exposed hilltops a distinctive red.

Location: Burning Hills WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Devils Garden - oddly shaped arches (including Metate Arch) and rock formations in the hills at the foot of the cliffs marking the Kaiparowits Plateau.

Location: Carcass Canyon WSA (east of WSA)

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: This area possesses exceptional scenic values and contains a

portion of the Cockscomb, a prominent southern Utah geologic feature. the Cockscomb forms 2 parallel knife-edged ridges with a bisection V-shaped trough. Flatirons, small monoliths, and other colorful formations are present on the west ridge. These major features of south central Utah cover over 4,000 acres.

Location: Mud Spring WSA.

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: An interesting fold in Henrieville Creek along the northwest boundary of the WSA is of geologic interest and a sightseeing attraction.

Location: Mud Spring WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Window Wind Arch above the middle trail has scenic value because of its location on the very edge of the Straight Cliffs. The Straight Cliffs escarpment is major landmark in south-central Utah and an important scenic feature within view from the Hole-in-the-Rock road. Woolsey Arch is located in Rock Creek Basin, an area of colorful Navaho sandstone and high cliffs.

Location: Fifty Mile Mountain WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Unique because it consists of 2 prominent southern Utah physiographic systems. It includes the eastern most extension of the White Cliffs component of the famous ascending staircase, cliff and terrace physiography, the Vermillion, White, and Pink Cliffs; and east of the Paria river, the dividing point is the landscape representative of the Glen Canyon physiography of sculptured, dissected, and exposed Navaho sandstone. The area where these merge between Deer Range and Rock Springs Bench is a highly scenic complex and colorful landscape.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Vermillion Cliffs with its associated Wingate Sandstone cliffs, colorful Chinle badlands, and canyons with there multiple colors and the intensity of coloration contribute to high scenic quality. Included in this landscape are Hackberry Canyon, Paria River Valley, Hogeys Canyon, the Pilot Ridge-Starlight Canyon-Kirbys Point area and Eight Mile Pass.

Location: Paria-Hackberry WSA.

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: An area of high scenic value include the breaks of the Rush Beds and the west wall of Cottonwood Canyon, upper tributaries to Hackberry Canyon, Death Valley Draw, and the exceptional Navajo Sandstone domes and fin formations on either side of lower Hackberry Canyon.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Four ONA's designated to preserve "unique scenic values and natural wonders". North Escalante Canyon (5,800 acres), The Gulch (3,430), Escalante Canyons (480 acres), Phipps-Death Hollow (12 more outside WSA)

 Location: North Escalante Canyons WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Location: North Escalante Canyons/The Gulch ISA

Description: This area is geologically complex and has some of the most outstanding canyon scenery in the country. Harris Wash a canyon of the classic Escalante River drainage canyon form with many entrenched meanders in the Navajo Sandstone.

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: A unique feature of the Burning Hills is the red coloration in the landscape is the result of geological changes attributed to the naturally occurring coal fires. The coloration creates a highly scenic area.

Location: Burning Hills WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The White Cliffs are high white or yellow cliffs of Navajo Sandstone. Vary in height from 600' at Deer Springs Point bench to 1,200' at Deer Springs Point and the Sheep Creek Bull Valley Gorge-Paria River confluence. The cliffs consistently reach a 1000' in height and the cliffline is interrupted by 8 canyons.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: This area contains twenty-four undeveloped springs. Ten are located in upper Paria, 6 in hackberry, 5 on the eastern border of Cottonwood Creek, and 3 on west boundary. There are also 6 developed springs. These are significant features in this arid environment.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Phipps-Death Hollow ONA (12/23/70) contains 34,288 acres managed to preserve scenic values and natural wonders.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Arches. Peek-a-boo Rock, Wahweap Window, Jacob Hamblin Arch, Starlight Arch, Cobra Arch, Sam Pollack Arch, Woolsey Arch, and several more unnamed arches and natural bridges.

Location: Kaiparowits Plateau and adjacent areas

Source: Sargent, K.A., Environmental Geologic Studies of the Kaiparowits Coal-Basin, Utah.

Description: Sand-calcite crystals from the Morrison Formation. These crystals are the first reported occurrence from rocks of Jurassic age and only reported sand crystals in southern Utah.

 Location: Kaiparowits Plateau

Source: Sargent, K.A., Environmental Geologic Studies of the Kaiparowits Coal-Basin, Utah. p. 18

Description: Circle Cliffs in the northeast portion of WSA features intensively colored red, orange, and purple Chinle mounds and ledges at the base of Wingate Sandstone cliffs. Vertically jointed cliffs banded with red, yellow, and white colors and bench tops and upper cliff faces possess innumerable orange-red Kayenta Sandstone knobs. One of most spectacular and distinctive landscapes on the Colorado Plateau.

Location: Steep Creek WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Area includes Escalante Natural Bridge (130' high, 100' span) and 4 other natural bridges and arches.

Location: Phipps-Death Hollow WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Gulch is a major geologic feature. Deeply entrenched very sheer red straight line Wingate Sandstone walls. High ridges and slickrock peaks. Ridges drop fairly abruptly to canyons below.

Location: Steep Creek WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Lamanite Natural Bridge. Actually a large arch with good symmetry and form. Located in an impressive setting in a deep side canyon to The Gulch.

Location: Steep Creek WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Petrified wood. Upper Gulch-Circle Cliffs contains large, unbroken logs of petrified wood (NEA 2,213 acres). Maximum log length 36'. The scenic values of these logs is enhanced by their colorful surroundings.

Location: Steep Creek WSA

Source: Utah Statewide Wilderness EIS, 1990 W FEIS 3B 19, and Sargent, K.A., Environmental Geologic Studies of the Kaiparowits Coal-Basin, Utah. p.13.

Description: Outstanding scenic values include the upper portion of Paradise Canyon where sandstone in the Wahweap Formation outcrops as colorful walls and cliffs. Ponderosa pine growing in the sandstone enhance the scenic values. Two sandstone monoliths or fins above Alvey Wash are prominent geological features.

Location: Death Ridge WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The area contains a unique canyon and bench system. The entire ISA contains outstanding scenery. Examples include the area east of Horse Canyon. Four canyons have isolated 10 benches of varying size. Many bench tops have

intricate pattern of innumerable orange-red Kayenta Sandstone knobs. Wolverine Canyon and Death Hollow have extremely narrow and convoluted sections. Another feature, Harris Wash a canyon of the classic Escalante River drainage canyon form with many entrenched meanders in the Navajo Sandstone.

Location: North Escalante Canyons/The Gulch ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Mollie's Nipple, an erosional remnant is a major landmark in the area.

Location: Kaiparowits Plateau.

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Natural Arches. Sam Pollock Arch, located at the head of a tributary drainage of Hackberry Canyon, and Starlight Arch located west of No Man's Mesa.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Area of diverse geology represented by spectacular deep canyons. The Escalante River canyon is 1100 feet deep. The canyon walls are rough and broken and the canyon is narrow and it meanders. Pure white to golden sandstone has been eroded into expanses of slickrock. Death Hollow Canyon is 1,000' feet deep and meandering. The extensive upper basin through which Mamie Creek flows is a extremely dissected area of canyons, tanks, other formations. Red layers of Carmel Formation cap high mesas and ledges of the exposed Kayenta Formation.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Petrified wood deposits just west of the Old Paria Townsite and in Hackberry Canyon. Both are in the Chinle formation.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: All the topographic features of the Kaiparowits region have been developed in sedimentary rocks. The Kaiparowits Plateau is a slightly tilted sedimentary mass that extends as a narrow mesa from the High Plateaus to Glen Canyon 70 miles distant. Its culminating point, Canaan Peak is an outlier of the Table Cliff Plateau; the Paria Plateau is a huge block of sandstone, the Waterpocket monicline is a ridge of folded rock intricately dissected and flanked by hogbacks, and the broken "comb" in the vicinity of Paria is the edge of sandstone beds upturned in the East Kaibab fold. The Circle Cliffs are inward-facing walls of sandstone that rim an oval depression. These prominent features are but large-scale examples of the mesas, buttes, and ridges that characterize the landscape of southern Utah.

Location: Kaiparowits Plateau region

Source: Gregory, H.E. and Moore, R. C. The Kaiparowits Region; A Geographic and Geologic Reconnaissance of Paria of Utah and Arizona. 1931.

Description: Paria River from Colorado River to its source, identified by NPS as

possessing values that may be of national significance, potential to be included in the National Wild and Scenic River System.

Location: Paria-hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Escalante River from Lake Powell to its source, a section of 14.9 miles, was designated as for study as a candidate Wild and Scenic River by the Secretary of the Interior on 10/11/70.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Lower Calf Creek Falls. Calf Creek Canyon is characterized by red alcoved walls, 2 waterfalls, and extensive expanses of white slickrock. Lower Calf Creek Falls drops 126' and Upper Calf Creek's drop is 86'. High educational values associated with interpretation of these areas.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The area contains 40 miles of perennial streams, a significant feature in this arid environment.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Objects of Paleontologic Interest, August, 1996

Description: Fossil assemblage photographs. Typical mollusks from Tropic Shale, south of Escalante include straight cone edphalopods, ammonites, gastropods, and pelecypods and Cretaceous sharks teeth from the Straight Cliffs Formation.

Location: Kaiparowits Plateau

Source: Sargent, K.A., Environmental Geologic Studies of the Kaiparowits Coal-Basin, Utah, pp 14-15

Description: Gray Cliffs/Pink Cliffs - This sequence of rocks may contain one of the best and most continuous records of Late Cretaceous terrestrial life in the world. Formation has yielded early mammals, lizards, dinosaurs, crocodillians, turtles, mollusks.

Location: Kaiparowits - The Blues WSA

Source: BLM, Escalante/Kanab RMP - Grand Staircase Ecosystem Analysis, 1994

Description: Fossils deemed by the Museum of Northern Arizona in a 1976 study to be of major importance. They are found in the Cretaceous Wahweap Formation outcrops include abundant fragments of turtle shells and dinosaurs, as well as several crocodile teeth. There is an excellent chance that mammal fossils will be found

Location: Kaiparowits Plateau - Nipple Bench unit

Source: BLM, Kaiparowits power project environmental impact statement, 1976

Description: The Straight Cliffs Formation is limited to the southern Utah area. It contains primitive mammals including one of the potentially oldest marsupial fossils identified.

Location: Kaiparowits Plateau

Source: BLM, Warm Springs Project Preliminary Draft EIS, 1996

Description: Invertebrate and vertebrate specimens found Straight Cliffs, Tropic Shale, and Dakota Formations. 13 collection sites recorded (gastropods, cephalopods in upper Cretaceous Formations, vertebrate in Dakota and Tropic Shales). Likely to occur along entire length of the Straight Cliffs

Location: Carcass Canyon WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Kaiparowits is of interest in understanding the evolution of mammals and other terrestrial vertebrates. Very little is known of Cretaceous mammals prior to the latest part of that period. The mid-Cretaceous mammalian twilight zone is spanned by the fossiliferous, terrestrial rock units of the Kaiparowits region. They contain unique evidence bearing on the early diversification of important mammalian groups of the Late Cretaceous. The thickness, continuity, and broad temporal distribution of the Kaiparowits sequence provides the opportunity to document changes in terrestrial vertebrate assemblages over a wide span of Late Cretaceous time.

Location: Kaiparowits Plateau

Source: Eaton, Jeffrey G. and Cifelli, Richard L. Preliminary report on Late Cretaceous mammals of the Kaiparowits Plateau, southern Utah, 1988

Description: Extremely significant fossils including marine and brackish water mollusks, turtles, crocodillians, lizards, dinosaurs, fishes, and mammals have been recovered from the Dakota formation, Tropic shale, Straight Cliffs Formation (Tibbet Canyon, Smoky Hollow, and John Henry members), and Wahweap formation in the area around the proposed Andalex mine and some localities lie directly along the proposed haul routes. This sequence of rocks (including the overlying Wahweap and Kaiparowits formations) contain perhaps the best and most continuous record of Late Cretaceous terrestrial life in the world

Location: Kaiparowits Plateau

Source: Eaton, Jeffrey G., Personal correspondence to Mr. Mike Noel, BLM, 1991

Objects of Prehistoric Interest

Description: Sixty sites have been recorded and the potential for additional sites is exceptionally high. Sites discovered to date include lithic scatters, 13 rockshelters (some w/storage cists and rock art), 1 pithouse village site and 1 structure (probably of Anasazi origin). Some of the rock art and rock shelter and 1 campsite are potentially eligible for nomination to the NRHP.

Location: North Escalante Canyons/The Gulch ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Friendship Cove Pictograph site nominated to NRHP. This site consists of a set of large Fremont style pictographs painted on the face of a large sandstone cliff.

Location: Phipps-Death Hollow ISA, eastern part

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Forty-four sites of diverse types have been recorded in the area. 14 rock art (petroglyph and pictographs sites (2 from Fremont culture), 1 Pithouse village site, lithic scatters of Paiute and Anasazi, and 6 rockshelters have been discovered. Potential for more sites is good.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Situated at the intersection of three major prehistoric cultures the Plateau has long been a magnet for archeological study. It has been recognized that the Kaiparowits Plateau might contain important clues that would aid in answering questions in the archeology of the Southwest.

Location: Kaiparowits Plateau

Source: Utah Wilderness Coalition. Wilderness at the Edge, p. 147 and Lister, Florence C., Kaiparowits Plateau and Glen Canyon prehistory, an interpretation based on ceramics, 1964

Description: Fiftymile Mountain Archeological District contains more than 400 sites including Anasazi habitations and granaries. Important scientific value. Some of the most significant cultural resources in the Four Corners area. Archaeological District (47,325 acre) has been nominated to NRHP. Majority of sites are masonry structures (of 1-10 rooms). Most are of Virgin Anasazi origin but include sites attributed to Fremont, Hopi, and Paiute. Navaho are also expected of occupying the area. 4,000 total sites may be located in WSA.

Location: Fiftymile Mountain WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Sixty-five sites have been recorded. They include lithic and ceramic scatters, masonry structures (granaries and storage cists), one rock shelter. Masonry and some lithic/ceramic associated with Virgin Anasazi/Virgin-Kayenta Anasazi. Two are Pueblo II-III time period. Some sites are associated with Paiute-age or Archaic-age peoples. At least 8 sites in this area are eligible for nomination to the NRHP.

Location: Wahweap WSA

 Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: High concentration of prehistoric sites. Although surveys are incomplete for the Warm Creek unit more than 600 sites have been found ranging from lithic scatters and campsites to rockshelters.

 Location: Kaiparowits Plateau/Warm Creek unit

 Source: BLM, Kaiparowits power project environmental impact statement, 1976

Description: Part of a larger area extensively used by the Kayenta Anasazi and later the Southern Paiute Indians. Site densities expected to be moderate to high.

 Location: Kaiparowits Plateau/Squaw Canyon unit

 Source: ERT, 1980, Kaiparowits coal development and transportation study, final report

Description: Prehistoric site densities are high on top of Nipple Bench. Sites represent Fremont, Virgin Anasazi and Kayenta Anasazi. The sites represent complex associations of features and artifacts and indicate permanent or extensive camps in rock shelters.

 Location: Kaiparowits Plateau/Nipple Bench unit

 Source: Fish, Paul, Preliminary Report Kaiparowits Power Project

Description: Six sites have been recorded. One is Pueblo II Anasazi occupation site, with others unidentified.

 Location: Burning Hills WSA

 Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: One hundred-five sites (primarily lithic scatters) have been recorded covering a broad period of occupation. Ten rockshelters w/storage cists or storage caches, 1 w/masonry room, 3 w/granaries associated with Anasazi or Fremont have been discovered. Additional sites include petroglyph and pictograph panels associated with shelter sites and 1 burial site.

 Location: Carcass Canyon WSA

 Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: One hundred thirty-four documented sites represent virtually all known prehistoric cultures in southern UT (Archaic, Fremont, Anasazi, Southern Paiute). 8,000 years of prehistory are represented. The sites primarily represent temporary habitation by hunter gatherers.

 Location: Death Ridge WSA

 Source: BLM Utah Statewide Wilderness EIS, 1990, and Hauck, F.R., Cultural Resource Evaluation of South-Central Utah, 1977-1978

Description: The area contains 41 recorded sites and based on surveys may contain exceptionally high densities of sites. Known sites include rockshelters, pit houses, lithic scatters, and masonry structures. Pictograph panels are in Deer Creek Canyon and petroglyphs are found in Snake Creek Canyon.

A study located and estimated 612 sites per 23,000 acres, 564 potentially eligible for nomination to the NRHP (southern border of WSA). Another inventory estimated 360 sites per 23,000 acres at the northern border of the WSA.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Kayenta Pueblo culture inhabiting the Straight Cliff and portions of the Escalante River drainage between A.D. 1000 and 1200 were likely in contact with the Fremont culture. Although both inhabited the area at the same time and competed for limited agricultural lands there is no evidence of open conflict during this time. Some modifications of pottery making techniques between the two cultures indicates that there was trade and exchange between them. Little is known positively about the Kayenta culture, and additional research in this area could provide valuable insight on interactions between the two cultures.

Location: Straight Cliffs WSA

Source: Lister, Kaiparowits Plateau and Glen Canyon Prehistory: An interpretation based on ceramics. 1964.

Objects of Historic Interest

Description: Dance Hall Rock/Hole-in-the-Rock Trail. While the Hole-in-the-Rock Trail was under construction in 1879, Mormon Pioneers camped at Fortymile Spring and held meetings and dances in the shelter of Dance Hall Rock. Designated historical site by DOI 1970.

Location: Two miles west of the Glen Canyon NRA on the Hole in the Rock Trail

Source: Utah Wilderness Coalition. Wilderness at the Edge. - p. 182

Description: Historic route constructed in 1879 to provide access from Escalante to areas on the opposite side of the San Juan River in Southeast Utah.

Location: Historic trail running from Escalante to Hole in the Rock in Glen Canyon NRA

Source: Lambrechtse, Rudi. Hiking the Escalante, 1985

Description: Boulder Mail Trail. Used to carry mail between Escalante and Boulder beginning in 1902. Much of trail still visible where necessary to construct through slickrock. Nominated to NRHP. Popular backpacking route.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Boynton Road. Constructed 1909 as short cut between Escalante and Salt Gulch. Abandoned after 2 years because of flooding. Visible over approx 9 of its 10 miles.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Escalante-Boulder telephone line: First Boulder-Escalante telephone line constructed by Forest Service in 1911 providing first phone service to area. Still visible between Antone Flat and Sand Creek.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Washington Phipps grave. A historical grave site of an early pioneer shot in 1878 in a dispute with his partner John Boynton. Provided the namesake for the area.

Location: Phipps Death Hollow

Source: Lambrechtse, Rudi. Hiking the Escalante, 1985

Description: Old Boulder Road. Main route between Escalante and Boulder until the CCC built Hell's Backbone Road and Highway 12 in 1930's to replace it.

Location: Phipps-Death Hollow ISA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: The Hattie Green mine, an early copper working located on the crest of The Cockscomb.

Location: The Cockscomb WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Old Paria Townsite was established in 1874 on the bench above the eastern bank of the Paria River by Mormon settlers who attempted to farm the bottomlands. Site was abandoned in 1890.

Location: adjacent to Paria-Hackberry WSA

Source: Abby, Edward and Hyde, Philip. Slickrock p.46

Description: Old Paria Townsite movie set. Built in the 1960's to film several movies. Now abandoned but still a popular recreation destination.

Location: adjacent to Paria-Hackberry WSA

Source: Abby, Edward and Hyde, Philip. Slickrock p.46

Objects of Biological Interest

Description: Riparian zones are corridors for many of the region's species, including neotropical migrant birds. The corridors (including the Escalante, and Paria Rivers and Johnson Creek and their tributaries) bisect the region north to south, allowing for exchange of individuals among different animal populations. The importance of movement corridors to the long term viability of animal populations is of great scientific and management interest. This area would afford many opportunities to enhance this ecological issue.

Location: Entire monument proposal including the Escalante area, Kaiparowits Plateau, and areas west to Kanab including the Escalante, Paria rivers and Johnson Creek

Source: Edwards, Tom, 1996; Knopf, 1985; Armbruster and Lande 1993; Beier, 1993; Belovsky, 1987; Brown, 1971; Davidson et al. 1996; Diamond, 1981; Fahrig and Merriam, 1985; Frankel and Soule, 1981; Harris and Gallagher, 1989; Heaney, 1984; IUCN, 1978; Kushlan, 1979; Lomolino and Channell, 1995; Meffe and Carroll, 1994; Newmark, 1995; Noss, 1993; Patterson, 1984; Pickett and Thompson, 1978; Primack, 1993; Saunders et al., 1991; Shaffer, 1981; Soule, 1987; Soule and Wilcox, 1980; Wegner and Merriam, 1979; Wilcove et al., 1986; Willis, 1974.

Description: 25 miles of riparian corridor in unit. Connects mountains to desert lowlands. Has great concentration of hanging gardens and riparian vegetation, including relictual populations in canyon bottoms. Also supports many rock crevice communities. Connects other protected areas. High plant endemism, due to large extent of parent material exposure.

Location: Escalante River

Source: BLM Wilderness EIS; Knopf, 1985; Shulz, 1993; Armbruster and Lande 1993; Beier, 1993; Belovsky, 1987; Brown, 1971; Davidson et al. 1996; Diamond, 1981; Fahrig and Merriam, 1985; Frankel and Soule, 1981; Harris and Gallagher, 1989; Heaney, 1984; IUCN, 1978; Kushlan, 1979; Lomolino and Channell, 1995; Meffe and Carroll, 1994; Newmark, 1995; Noss, 1993; Patterson, 1984; Pickett and Thompson, 1978; Primack, 1993; Saunders et al., 1991; Shaffer, 1981; Soule, 1987; Soule and Wilcox, 1980; Wegner and Merriam, 1979; Wilcove et al., 1986; Willis, 1974.

Description: Riparian corridor links high country to lowland desert scrub. Connects protected areas. Has high concentrations of isolated communities: hanging garden, rock crevice and canyon bottom communities. Also has an abundance of packrat middens.

Location: Paria River

Source: Van Devender and Spaulding, 1979; BLM Wilderness EIS; Knopf, 1985; Shulz, 1993; Armbruster and Lande 1993; Beier, 1993; Belovsky, 1987; Brown, 1971; Davidson et al. 1996; Diamond, 1981; Fahrig and Merriam, 1985; Frankel and Soule, 1981; Harris and Gallagher, 1989; Heaney, 1984; IUCN, 1978; Kushlan, 1979; Lomolino and Channell, 1995; Meffe and Carroll, 1994; Newmark, 1995; Noss, 1993; Patterson, 1984; Pickett and Thompson, 1978; Primack, 1993; Saunders et al., 1991; Shaffer, 1981; Soule, 1987; Soule and Wilcox, 1980; Wegner and Merriam, 1979; Wilcove et al., 1986; Willis, 1974.

Description: Fifty miles of perennial streams including the Paria River (which is a wild and scenic river inventory segment). Riparian vegetation covers 500 acres.

Location: Paria-Hackberry WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Three major floras meet in this area. Plants from the Mojave, Arizona deserts and northern Utah are all found here, with a few species from the Great Plains. The Colorado Plateau is surrounded by high mountains, isolating the flora and fauna. Unlike many ecosystems, the plant density, diversity and stature within the monument is determined more by substrate than climate. Consequently, isolation, plus the great diversity of substrates (providing a wide range of soil chemistry and physical characteristics) found within close proximity to each other has resulted in a high level of plant endemism in this area. Eleven species found in the monument are found nowhere else in the world. Of plants that occur only in Utah or on the Colorado Plateau, 125 species occur in the monument. The Canyonlands portion of the Colorado Plateau, much of which is contained in the monument, is considered the richest floristic region in the Intermountain West, and contains 50% of Utah's rare and endemic plants. 90% of these rare and endemic species are found on substrates typical of most of the monument. Of the Canyonlands area, the monument area is considered one of the most significant for endemic populations, with more than 10% of the flora being found nowhere else.

Of additional significance is that many of the plants in the monument are diploid species. This means they represent the basic genetic stock from which polyploid species in the area evolved. This makes this area of great significance to plant evolutionary biologists and provides a unique opportunity to study the evolution and speciation of plant species, as well as the structure and dynamics of plant communities, independent of climate.

Location: Entire monument

Source: Kaiparowits Power Project EIS; Axelrod, 1960; Utah Natural Heritage Program plant database; Nabhen and Wilson, 1996; Shulz, 1993; Albee et al., 1988; Welsh, 1974; Welsh et al. 1975; Hintze, 1988; Dott, 1996; Shreve, 1942; Cronquist et al., 1977; Utah Natural Heritage Program plant database

Description: The Colorado Plateau was uplifted and downcut without deformation. As a consequence, large areas of unmixed geologic parent materials are exposed, and plants must adapt to large array of highly distinct parent materials. These substrates are sharply demarcated, and often occur within a few meters of each other. This situation offers the unique opportunity to examine the role of soil physical and chemical characteristics in determining plant and animal community structure independent of climatic variables, an important ecological question. It also results in different plant community structure and dynamics than is generally observed in other ecosystems. This area contains shales, siltstones, mudstones, sandstones and limestone of differing depths, and deposited in a variety of environments (marine, freshwater and eolian). Each soil depth and depositional environment has very different chemical and physical characteristics. As a result, there is a great diversity of substrates in this area, each supporting a unique plant community.

Location: Entire monument

Source: Hintze, 1988; Nabhen and Wilson, 1996; Gross, 1987; Dott, 1996; Roberts, 1987

Description: The presence of steep elevational gradients gives the opportunity to sort out the role of temperature and precipitation in structuring plant and animal communities. Elevational gradients have traditionally been used by scientists as a way of examining factors controlling biotic community structure. Juxtaposition of diverse substrates and elevational gradients gives an unparalleled opportunity to determine the respective roles of soil chemistry, physical characteristics, elevation, rainfall and temperature in structuring biotic communities. In addition, it allows for high biodiversity in a small area.

Location: Entire monument

 Source: Kaiparowits Power Project EIS; Axelrod, 1960; Utah Natural Heritage Program plant database; Nabhen and Wilson, 1996; Shulz, 1993; Albee et al., 1988; Welsh, 1974; Welsh et al. 1975; Hintze, 1988; Dott, 1996; Shreve, 1942; Cronquist et al., 1977

Description: The Escalante Plateau is the home to approximately 300 species of amphibians, birds, mammals, and reptiles. This diverse set of wildlife species includes over 20 species of birds of prey including the bald eagle, peregrine falcon, and was the historical range of the condor. The region contains 2 of the 7 recognized centers of endemism for fishes of the western United States.

Location: Escalante Plateau

Source: Davidson et al. 1996; Tom Edwards, 1996; Behnke, R.J., and Zar, M., 1976

Description: Contains many different geologic substrates (therefore soils with different physical and chemical attributes) in a small area. The majority of endemic in Utah are found on these particular substrates; consequently, this area is expected to have a high concentration of endemics.

Location: Escalante -along boundary of Glen Canyon NRA and Capital Reef National Park

Source: Utah Natural Heritage Program plant database; Nabhen and Wilson, 1996; Shulz, 1993; Albee et al., 1988; Welsh, 1974; Welsh et al. 1975; Hintze, 1988

Description: Large expanses of fine-textured soils (Morrison, Mancos/Tropic) shales support large number of endemic plant species, fossils.

Location: Henrieville to Escalante

Source: Hintze, 1988; Shulz, 1993; BLM Wilderness EIS

Description: An exposed monocline with many soils/substrates in close juxtaposition provides tremendous biodiversity of both general and endemic flora. High salt content of stream provides habitat for salt-tolerated riparian plants. Provides a elevational gradient from ponderosa pine to desert scrub. In addition, the rocky substrate has provided refugia for many Arcto-Tertiary plants, providing a unique opportunity to examine the effects of ancient floral presence in the structuring of present-day plant communities. This area also supports a very high diversity of both general and endemic flora.

Location: The Cockscomb

Source: Hintze, 1988; Shulz, 1993; Albee et al., 1988; Axelrod, 1960; Welsh, 1978; Stevens, 1992; Dott, 1996;

Description: Contains a concentration of many different geologic substrates/soils with different physical and chemical attributes. This area has a high concentration of endemics. This boundary also abuts protected areas (Glen Canyon, Capitol Reef), thereby effectively increasing the value of all three areas for biological conservation. In addition, the Waterpocket Fold has isolated two outcrops of the same parent material. These two areas now support different floras. This presents an outstanding scientific opportunity to explore processes of speciation.

Location: Far eastern boundary

Source: Hintze, 1988; Shulz, 1993; Albee et al., 1988; Axelrod, 1960; Welsh, 1978; Stevens, 1992; Dott, 1996; Armbruster and Lande, 1993; Fahrig and Merriam, 1985; Beier, 1993; Belovsky, 1987; Brown, 1971; Davidson et al. 1996; Diamond,

1981; Frankel and Soule, 1981; Harris and Gallagher, 1989; Heaney, 1984; IUCN, 1978; Kushlan, 1979; Lomolino and Channell, 1995; Meffe and Carroll, 1994; Newmark, 1995; Noss, 1993; Patterson, 1984; Pickett and Thompson, 1978; Primack, 1993; Saunders et al., 1991; Shaffer, 1981; Soule, 1987; Soule and Wilcox, 1980; Wegner and Merriam, 1979; Wilcove et al., 1986; Willis, 1974.

Description: This is an exposed monocline. Consequently, many substrates (Summerville, Morrison, Dakota, Tropic, Entrada, Navajo, Wingate and Carmel) are exposed directly next to each other, providing an opportunity for studies of ecological processes independent of climate. This monocline also has an elevational gradient, facilitating the study of effects of temperature and moisture on community dynamics. In addition, the rocky substrate has provided refugia for many Arcto-Tertiary plants, providing a unique opportunity to examine the effects of ancient floral presence in the structuring of present-day plant communities. This area also supports a very high diversity of both general and endemic flora.

Location: Straight Cliffs area

Source: Hintze, 1988; Shulz, 1993; Albee et al., 1988; Axelrod, 1960; Welsh, 1978.

Description: Diversity of plant life ranging from low desert shrub to Ponderosa Pine (less than 1 mile apart) enhances the study and observation of ecology. 3 small stands of Ponderosa pine in Alvey Wash.

Location: Death Ridge WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Contained within the monument are 3-5 spatially separated areas where the same substrates are exposed in close proximity to each other. In addition, there are 5 elevational gradients along riparian corridors. This is critical for replicated scientific work to be conducted.

Location: Entire monument

Source: Hintze, 1988; USGS Topographical Maps

Description: Riparian corridor with elevational gradient, connecting desert low lands to the high country. Vermillion, White, Pink Cliffs (Triassic, Jurassic, Cretaceous material).

Location: Johnson's Creek

Source: Hintze, 1988; USGS Topographical Maps; Beier, 1993; Noss, 1992, 1993

Description: Fifty Mile Mountain. Presence of aspen on Pleasant Grove, Steer Canyon, and Pinto Mare Canyons.

Location: Fifty Mile Mountain WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Protects lands at low elevation sites frequently rich in species diversity. The range of elevation in these areas from approximately 4500-8300 feet encompasses a wide variation in elevation and will capture the full diversity of plant and animal species in the region.

Location: Entire monument proposal including the Escalante area, Kaiparowits Plateau, and areas west to Kanab

 Source: Hintze, 1988; Utah BLM Final Wilderness EIS, 1990

Description: The monument contains an abundance of hanging gardens, tinajas, canyon bottom, dunal pockets, salt-pocket and rock crevice communities. These small, isolated populations often contain unusual, often relictual plants and animals. Hanging gardens and canyon bottom communities harbor riparian plants and their pollinators, as well as unique vertebrates (bats and small mammals) and soil fauna. Tinajas are important aquatic resources, and contain a diverse array of tadpole, fairy and clam shrimp, amphibians, algae, water beetles, other crustaceans, snails, mosquito and gnat larvae and aquatic/riparian plants. Highly saline areas are found around many seeps and streams, and consist of plants and animals adapted to highly saline conditions. Dunal pockets contain species adapted to shifting sands, while rock crevice communities consist mostly of slow-growing species that can thrive in extremely infertile sites. These communities offer a chance to examine gene flow dynamics, and to distinguish the respective role of pollen versus seeds. They offer an opportunity to study ground water flow dynamics in the absence of significant fluvial processes, and island biogeography of plants, pollinators and ground-dwelling biota. They also are highly simplified, discrete ecosystems, making them ideal for elucidating basic ecosystem processes.

 Location: Entire monument

Source: Nabhen and Wilson, 1996; Harper et al., 1994; Welsh et al., 1993; May et al., 1995; Fowler et al., 1995; Graff, 1988

Description: These canyons provide a high concentration of isolated, unique plant and invertebrate communities: hanging garden, rock crevice, and canyon bottom communities. Many relictual plant species can be found in these communities. Pack rat middens are abundant, providing paleoclimate and paleo-vegetation information.

 Location: Escalante Canyons

Source: Axelrod, 1960; BLM Wilderness EIS; Van Devender and Spauling, 1979; Fowler et al., 1995; Nabhen and Wilson, 1996

Description: Dunal pockets contribute Great Plains species to the flora. These are unique, isolated plant communities.

 Location: Cockscomb to Kaiparowits

Source: Hintze, 1988

Description: Unique, isolated communities are located throughout the monument. These include hanging gardens, tinajas, canyon bottom, dunal pocket, salt pocket and rock crevice communities. They provide great opportunities for examining evolution, gene flow, island biogeography and other ecological principles.

 Location: Entire monument

Source: Case and Cody, 1988; Diamond, 1981; Dott, 1996; Harris, 1984; Ludwig and Whitford, 1981; Fowler et al., 1995; Nabhen and Wilson, 1996; Roberts, 1987; Reice, 1994; Axelrod, 1960

Description: Biological conservation theory and literature suggests that large contiguous conservation areas increase both extent and probability of population survival, increases protection of migratory pathways, and is the most effective means of conserving aquatic and riparian communities.

 Location: Entire monument

 Source: Soule, 1987; Davidson et al., 1996; Miller, 1961; Minckley and Deacon, 1968; Armbruster and Lande, 1993; Fahrig and Merriam, 1985; Beier, 1993; Belovsky, 1987; Brown, 1971; Davidson et al. 1996; Diamond, 1981; Frankel and Soule, 1981; Harris and Gallagher, 1989; Heaney, 1984; IUCN, 1978; Kushlan, 1979; Lomolino and Channell, 1995; Meffe and Carroll, 1994; Newmark, 1995; Noss, 1993; Patterson, 1984; Pickett and Thompson, 1978; Primack, 1993; Saunders et al., 1991; Shaffer, 1981; Soule, 1987; Soule and Wilcox, 1980; Wegner and Merriam, 1979; Wilcove et al., 1986; Willis, 1974.

Description: The connection with Glen Canyon provides a larger protected area. It also provides low desert vegetation as part of the vegetational gradients. Large areas are important for maintaining the evolutionary potential of plants and animals, allowing for the exchange of genetic material among the separate populations that constitute a population.

Location: Common boundaries and riparian connections with Glen Canyon NRA, Capitol Reef NP, Box Hollow Wilderness and Paria Wilderness

Source: Hintze, 1988; Shulz, 1993; Albee et al., 1988; Axelrod, 1960; Welsh, 1978; Stevens, 1992; Dott, 1996; Armbruster and Lande, 1993; Fahrig and Merriam, 1985; Beier, 1993; Belovsky, 1987; Brown, 1971; Davidson et al. 1996; Diamond, 1981; Frankel and Soule, 1981; Harris and Gallagher, 1989; Heaney, 1984; IUCN, 1978; Kushlan, 1979; Lomolino and Channell, 1995; Meffe and Carroll, 1994; Newmark, 1995; Noss, 1993; Patterson, 1984; Pickett and Thompson, 1978; Primack, 1993; Saunders et al., 1991; Shaffer, 1981; Soule, 1987; Soule and Wilcox, 1980; Wegner and Merriam, 1979; Wilcove et al., 1986; Willis, 1974.

Description: Cryptobiotic soil crusts are critical for soil stability, nutrient availability for vascular plants and normal soil surface temperatures. These crusts are extremely fragile and easily disrupted by soil surface disturbances such as trampling or off-road vehicles. Since the soils in the monument are highly susceptible to erosion, it is important that these biocrusts be protected so they stabilize these erodible soil surfaces. In addition, these ecosystems have few nitrogen-fixing plants. Since these crusts provide nitrogen to these soils, they are a critical part of these nitrogen-limited ecosystems.

Location: Entire monument

Source: Belnap, 1994, 1995; Belnap and Harper, 1995; Belnap et al., 1994; Jefferies, 1989; Harper and Marble, 1988; Johansen, 1993; Mack and Thompson, 1978; Fleischner, 1994

Description: Disturbance of most soil surfaces in the monument area will result in soil surface temperature changes, as bio-crusts are darker than the substrates underneath them. The expected lowering of temperature with disturbance would result in cooler soil temperatures, and thus later spring plant germination and lower nutrient uptake rates. This may adversely effect desert plant growth in early spring. Surface temperatures also influence foraging and burrowing patterns for many soil invertebrates, and many effect community dynamics of these species.

Location: Entire monument

Source: Ludwig and Whitford 1981; Belnap 1995

Description: Ecosystems in this area are some of the most stable documented to date, as both large and small scale disturbances are limited spatially and temporally. Very little of this area was glaciated in the Pleistocene. Most plant communities evolved without fire or grazing by large ungulate herds, as evidenced by characteristics of the soils and the flora. Catastrophic events are minimal, with the exception of wash bottoms. Microsite disturbances are minimal as well, as most soils support very low populations of invertebrates. 1880

photos repeated in 1990 show many sites virtually unchanged, with the same tree, shrub and grass individuals present, indicating very low species turnover rates in this region relative to other ecosystems. In addition, dead tree branches can still be found in virtually the same condition as they were 100 years ago, indicating plant tissue decomposition rates are extremely low in this region. This makes this area highly unique, as most ecosystems are believed to be structured disturbance. In this region, ecological processes can be studied independent of the effects of disturbance to give us greater insight into their functioning (i.e. factors controlling exotic plant invasions, species-species interactions, etc.)

Soil physical, chemical and biological features appear to be both easily damaged (low resistance) by surface disturbance and have very slow recovery rates (low resilience) when compared to other deserts or more mesic systems. This may be a result of evolution of this ecosystem evolving in the relative absence of disturbance (Belnap 1995, 1996). Therefore, this area is important in the study of how disturbance influences community dynamics, including species-species interactions, and for understanding how to restore these fragile systems. This also means that this area is highly susceptible to damage by different land uses, including recreation and grazing.

Location: Entire monument

Source: Belnap, 1995, 1996; Belnap et al., 1994; Mack and Thompson, 1982; Fleischner, 1994; Kleiner and Harper 1972; Harper et al., 1994; Webb, 1994; Rogers, 1982; Pickett and White, 1985; Moldenke, 1995; Evans and Ehleringer, 1993; Turner et al. 1993; Iverson et al. 1981; Webb and Wilshire 1981; Larsen 1996; Bowers et al. 1994

Description: Isolation of this area has resulted in minimal human impacts. Many of the ecosystems found in this area have received little, if any, human use and the type and extent of disturbance has that has occurred is known. In addition, there are large areas unbroken by roads. This is essential to the protection and conservation of plant and animal species.

Location: Entire monument

Source: Wilcox et al 1986; Wilcox and Murphy 1985; Mader et al., 1990; Osley, et al., 1974; Rost and Bailey, 1979; Witmer and Calesta, 1985

Description: The monument lacks any areas that have been invaded to any large extent by exotic species. There are few such areas in the Intermountain West, and they can provide invaluable information in understanding the ecology and dynamics of exotic plant invasion. These areas aid scientists in understanding what makes systems resistant to such invasions, and thus help land managers predict what areas are susceptible to invasion and restore already-invaded regions.

Location: Entire monument

Source: Billings, 1994; Fleischner, 1994; Forcella and Harvey, 1983; Gross, 1987; Hunter, 1990; Loope et al., 1988; MacMahon, 1987; Pellant and Hall, 1994

Description: Six threatened or endangered candidate species are located within or near this area.

Location: Wahweap WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Contains Peregrine falcon (endangered) and 6 special status animal species and 5 special status plant species.

Location: Mud Spring WSA

 Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Habitat for Swainson's hawk, golden eagle (Sensitive) and peregrine falcon (endangered).

Location: The Blues WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Peregrine falcon and bald eagle (endangered). 8 animal and 5 plant species of special status.

Location: Paria-Hackberry and Cockscomb WSA and Wahweap WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Thirteen species of raptors are known or suspected of nesting in the WSA

Location: Burning Hills WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Relict plant community in the upper part of Dry Valley "probably possesses important scientific values"

Location: Mud Spring Canyon WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: Unique relict plant community of pinion-juniper and sagebrush-grass park vegetation accessible only by a steep trail. One of the few remaining unaltered plant communities in Utah. No Man's Mesa RNA was designated as an ACEC in 1986. Such areas are invaluable to science. They provide restoration and management goals for administration of lands. Such areas are also critical to scientists who are trying to understand the natural functioning of ecosystems. Grasslands are especially valuable, as almost all have been heavily grazed for over a century.

Location: Paria-Hackberry WSA (No Man's Mesa and Little No Man's Mesa)

Source: Utah BLM Statewide Final Wilderness EIS, 1990 and Kleiner and Harper, 1972

Description: Four Mile Bench Old Tree Area. Unique area of extremely old (1,400 years) pinon and juniper trees. Unique scientific values on over 1,000 acres.

Location: Wahweap WSA

Source: Utah BLM Statewide Final Wilderness EIS, 1990

Description: This region is at the northern end of areas that receive summer monsoonal rains, and is at the southern end of areas that depends on winter rains. This distinction is very important to the physiological functioning of plants in this moisture-limited areas, as even minor changes in temperature and/or rainfall may lead to major differences in water availability, and consequently, plant metabolic processes. Climate change is expected to alter both rainfall timing and amount, as well as temperature. This, in turn, would alter plant physiology, water use patterns and community composition in this

region, making the monument an excellent place for studying global climate change.

Location: Entire monument

Sources: Ayyad 1981; Graff 1988; Van Devender and Spaulding 1979; Wagner 1981

Description: Unlike most deserts that are primarily depositional environments, the CP is an erosional one (Welsh 1979; Nat Hist). This contributes to high endemism, as substrate material is not mixed. In addition, it makes this region highly susceptible to soil loss when surfaces are disturbed. This soil loss has a negative impact on plant and aquatic communities, as well as dam sediment loads.

Location: Entire monument

Source: Welsh, 1979; Harper et al., 1994

Description: The effects of scaling up and down are not known for many ecological processes. The multitude of variably sized, discrete watersheds found in this area offer a unique opportunity to test the effects of scaling for hydrological and biological processes. In addition, the close spacing of these watersheds offers a chance to separate the effects of area per se from other environmental factors on community structure.

Location: Entire monument

Source: Allen and Hoekstra 1987; Reice 1994; Pickett and White 1985; Rosenweig 1985

Description: Semi-arid and arid lands of the western United States are highly susceptible to desertification. The lack of natural disturbance in much of this area offers the opportunity to study the effects of different types and levels of land use and to better understand the steps leading to desertification.

Location: Entire monument

Source: Dregne, 1983

Description: This area contains few exotic plants. Having this resource gives the opportunity to better understand what factors inhibit or facilitate exotic plant invasions. Roads have been heavily implicated in facilitating exotic plant invasion, while intact Cryptobiotic soil crusts and less favorable soil chemistry may inhibit such an invasion. Invasion could fundamentally alter these communities, by altering species composition, community dynamics and fire cycles.

Location: Entire monument

Source: Monsen and Kitchen, 1994; Kelly 1996; Harper and Marble 1988; Davidson et al. 1996

Description: Quaternary resources are abundant in the monument. Pack rat middens enable reconstruction of paleoclimates and paleo-vegetation, while Pleistocene animal remains found in alcoves.

Location: Entire monument

Source: Harper et al., 1994

Description: Unlike more mesic ecosystems, there is little evidence that desert communities demonstrate traditional successional sequences. There is little or

no modification of soils or other site characteristics by previous-occurring plants. Understanding of this is important for restoration efforts. The monument offers an excellent opportunity to study this phenomenon independent of climate and disturbance factors.

Location: Entire monument

Source: Barbour, 1981; MacMahon, 1987; Shreve, 1942; Dott, 1996

Description: Peregrine falcon and Bald Eagle use these areas. Areas are habitat for 7 plant and 9 animal species considered sensitive.

Location: Death Ridge and Fifty Mile Mountain WSAs

Source: Utah Statewide Wilderness Study Report, 1991

Description: Peregrine falcon and Bald Eagle use these areas. Areas are habitat for 8 plant and 7 animal species considered sensitive.

Location: Phipps Death Hollow ISA and Steep Creek WSA

Source: Utah Statewide Wilderness Study Report, 1991

Description: Peregrine falcon and Bald Eagle use these areas. Areas are habitat for 9 plant and 7 animal species considered sensitive.

Location: North Escalante Canyon, The Gulch and Carcass Canyon WSAs

Source: Utah Statewide Wilderness Study Report, 1991

The Dinosaurs of Grand Staircase-Escalante National Monument

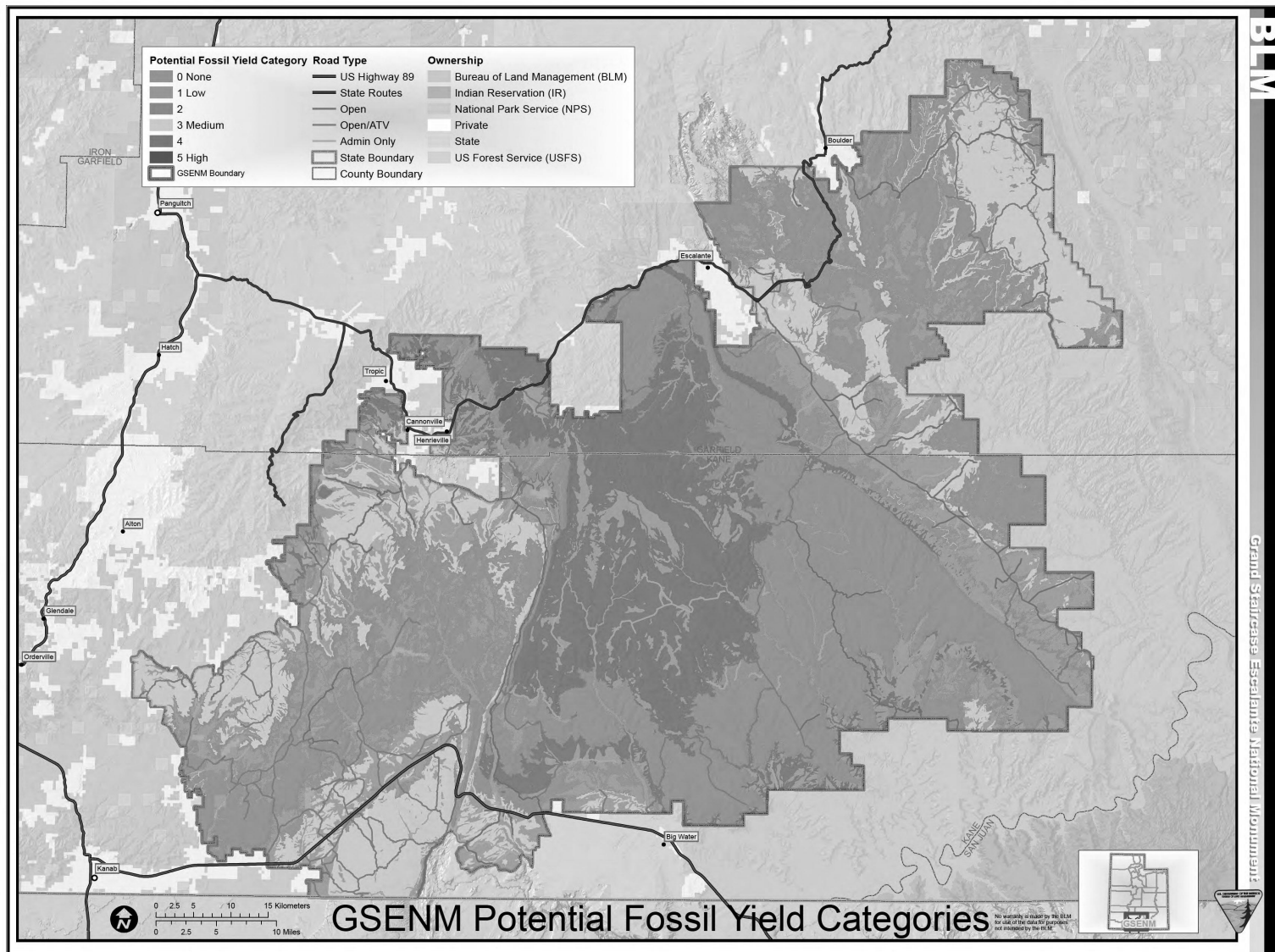
The Dinosaurs of Grand Staircase Escalante National Monument
Part V Kaiparowits Formation

ORDER SAURISCHIA (LIZARD-HIPPED DINOSAURS)				
<u>Family</u>	<u>Genus/Species</u>	<u>Meaning of name</u>	<u>Lifestyle</u>	<u>Abund.</u>
Ornithomimidae (ostrich mimics)	<i>Ornithomimus</i> sp.	bird mimic	Carnivore/omnivore	U
Oviraptoridae (toothless raptors)	<i>Hagryphus giganteus</i>	giant reptile god from the west desert	Carnivore	VR
Troodontidae (large-brained raptors)	<i>Talos sampsoni</i>	wounding tooth	Carnivore	U
Dromaeosauridae (raptors)	? <i>Dromaeosaurus</i> sp. <i>Ricardoestes</i> <i>Saurornitholestes</i> sp.	Running reptile Richard Estes Reptilian bird thief	Carnivore Carnivore Carnivore	U U C
Aviales (birds)	<i>Avisaurus</i> sp.	bird-lizard	?Carnivore	VR
Tyrannosauridae (giant predators)	<i>Teratophoneus curriei</i>	Monstrous killer	Carnivore	U
ORDER ORNITHISCHIA (BIRD-HIPPED DINOSAURS)				
<u>Family</u>	<u>Genus/Species</u>	<u>Meaning of name</u>	<u>Lifestyle</u>	<u>Abund.</u>
Hypsilophodontidae (small, primitive ornithopod dinosaurs)	New genus and species I		Herbivore	C
Hadrosauridae (duck-bills)	<i>Gryposaurus</i> cf. <i>G. notabilis</i>	important griffin	Herbivore	C
Hadrosaurinae (non-crested hadrosaurs)	<i>Gryposaurus monementensi</i>	monument griffin	Herbivore	C
Hadrosauridae (duck-bills) Lambeosaurinae (crested hadrosaurs)	<i>Parasaurolophus</i> ?new species	like <i>Saurolophus</i>	Herbivore	C
Ceratopsidae (horned dinosaurs) Chasmosaurinae (large-frilled horned dinosaurs)	<i>Utahceratops gettyi</i> <i>Kosmoceratops richardsoni</i>		Herbivore Herbivore	C R
Ceratopsidae (horned dinosaurs) Centrosaurinae (small-frilled horned dinosaurs)	<i>Nasutoceratops titusi</i> New genus and species II	Big nose horn face	Herbivore Herbivore	VR VR
Pachycephalosauridae (dome-headed dinosaurs)	New genus and species I		Herbivore	R
Nodosauridae (spike-tailed armored dinosaurs)	?cf. <i>Edmontonia</i>	Edmonton (Canada) dino	Herbivore	R
Ankylosauridae (club-tailed armored dinosaurs)	New genus and species I		Herbivore	R
	New genus and species I		Herbivore	R

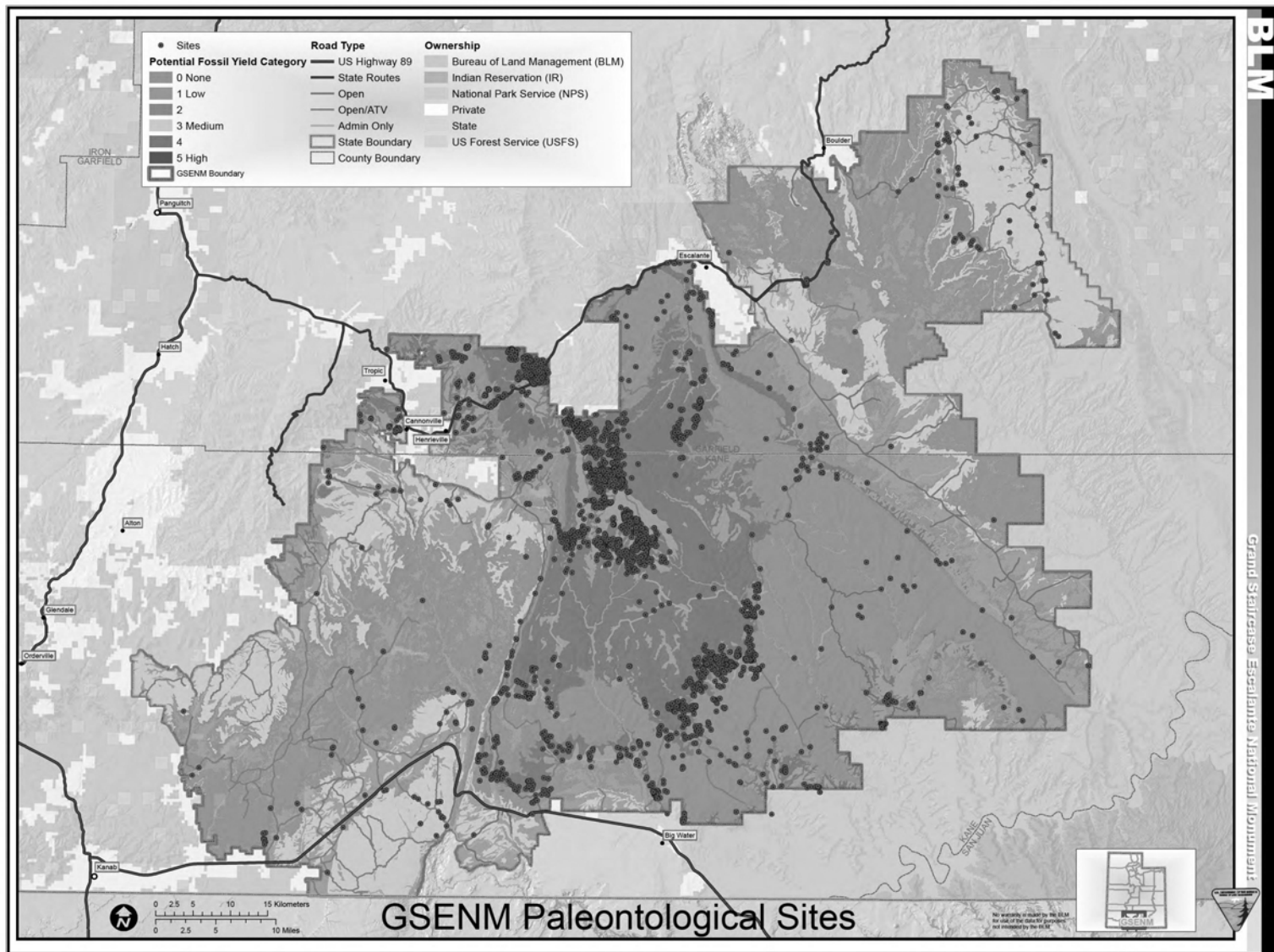
The Dinosaurs of Grand Staircase Escalante National Monument
Part IV Wahweap Formation

ORDER SAURISCHIA (LIZARD-HIPPED DINOSAURS)				
<u>Family</u>	<u>Genus/Species</u>	<u>Meaning of name</u>	<u>Lifestyle</u>	<u>Abund.</u>
Troodontidae (large-brained raptors)	Tooth genus I		Carnivore	U
Dromaeosauridae (raptors)	Tooth genus I		Carnivore	U
	Tooth genus II		Carnivore	U
	Tooth genus III		Carnivore	C
Tyrannosauridae (giant predators)	<i>Lythronax argestes</i>		Carnivore	U
ORDER ORNITHISCHIA (BIRD-HIPPED DINOSAURS)				
<u>Family</u>	<u>Genus/Species</u>	<u>Meaning of name</u>	<u>Lifestyle</u>	<u>Abund.</u>
Hypsilophodontidae (small, primitive ornithopod dinosaurs)	New genus and species I		Herbivore	C
Prohadrosaurinae	New genus and species I		Herbivore	U
Hadrosauridae (duck-bills) Hadrosaurinae (non-crested hadrosaurs)	<i>Acristavus</i> sp c.f. <i>Brachylophosaurus</i> sp.		Herbivore	C C
Hadrosauridae (duck-bills) Lambeosaurinae (crested hadrosaurs)	<i>Adelolophus hutchisoni</i>		Herbivore	R
Ceratopsidae (horned dinosaurs) Centrosaurinae (small-frilled horned dinosaurs)	<i>Diabloceratops eatoni</i>		Herbivore	VR
	<i>Machairoceratops cronusi</i>		Herbivore	VR
Pachycephalosauridae (dome-headed dinosaurs)	New genus and species I (like <i>Avaceratops</i> ?)		Herbivore	VR
Pachycephalosauridae (dome-headed dinosaurs)	New genus and species I		Herbivore	R
Nodosauridae (spike-tailed armored dinosaurs)	?cf. <i>Panoplosaurus</i>		Herbivore	R

Grand Staircase-Escalante National Monument
Bureau of Land Management Map of Potential
Fossil Yield Categories



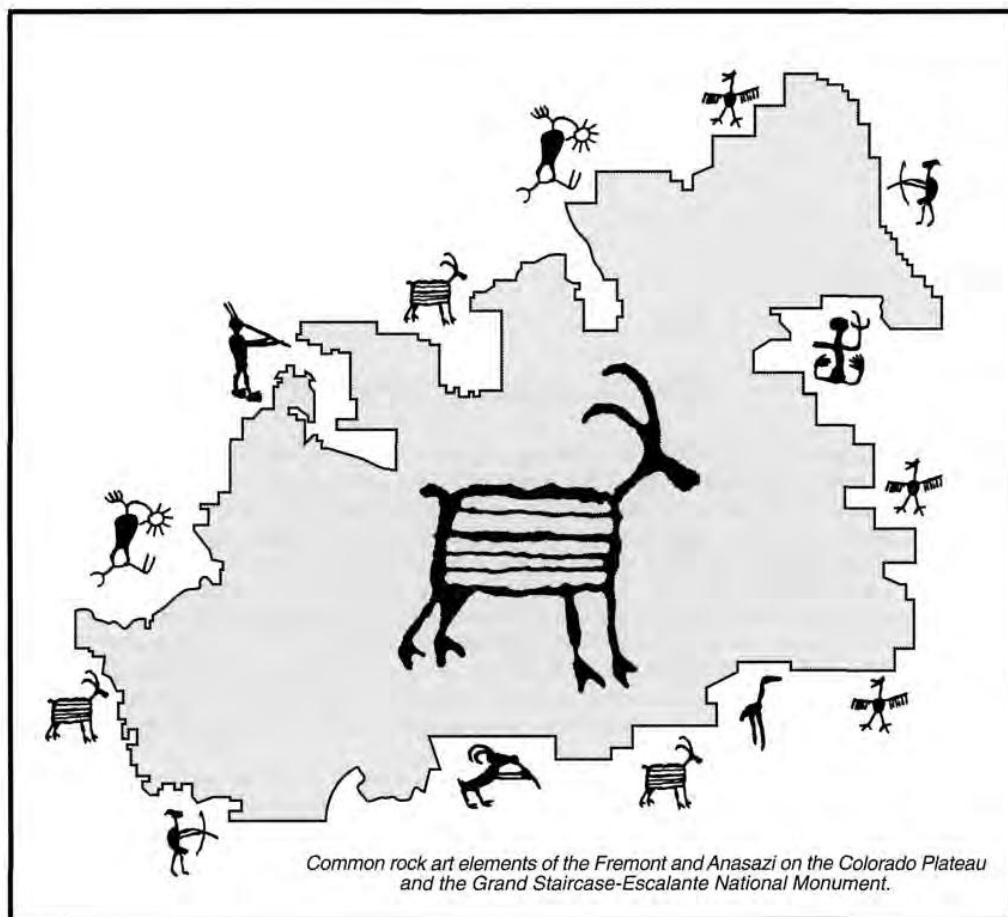
Grand Staircase-Escalante National Monument
Bureau of Land Management Map of
Paleontological Sites



Map of School and Institutional Trust Lands
within Grand Staircase-Escalante National
Monument Prior to 1998

A PRELIMINARY ASSESSMENT OF ARCHAEOLOGICAL RESOURCES WITHIN THE GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT, UTAH

by
David B. Madsen



CIRCULAR 95
UTAH GEOLOGICAL SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES

1997



ISBN 1-55791-605-5

DOI-2019-04 02425

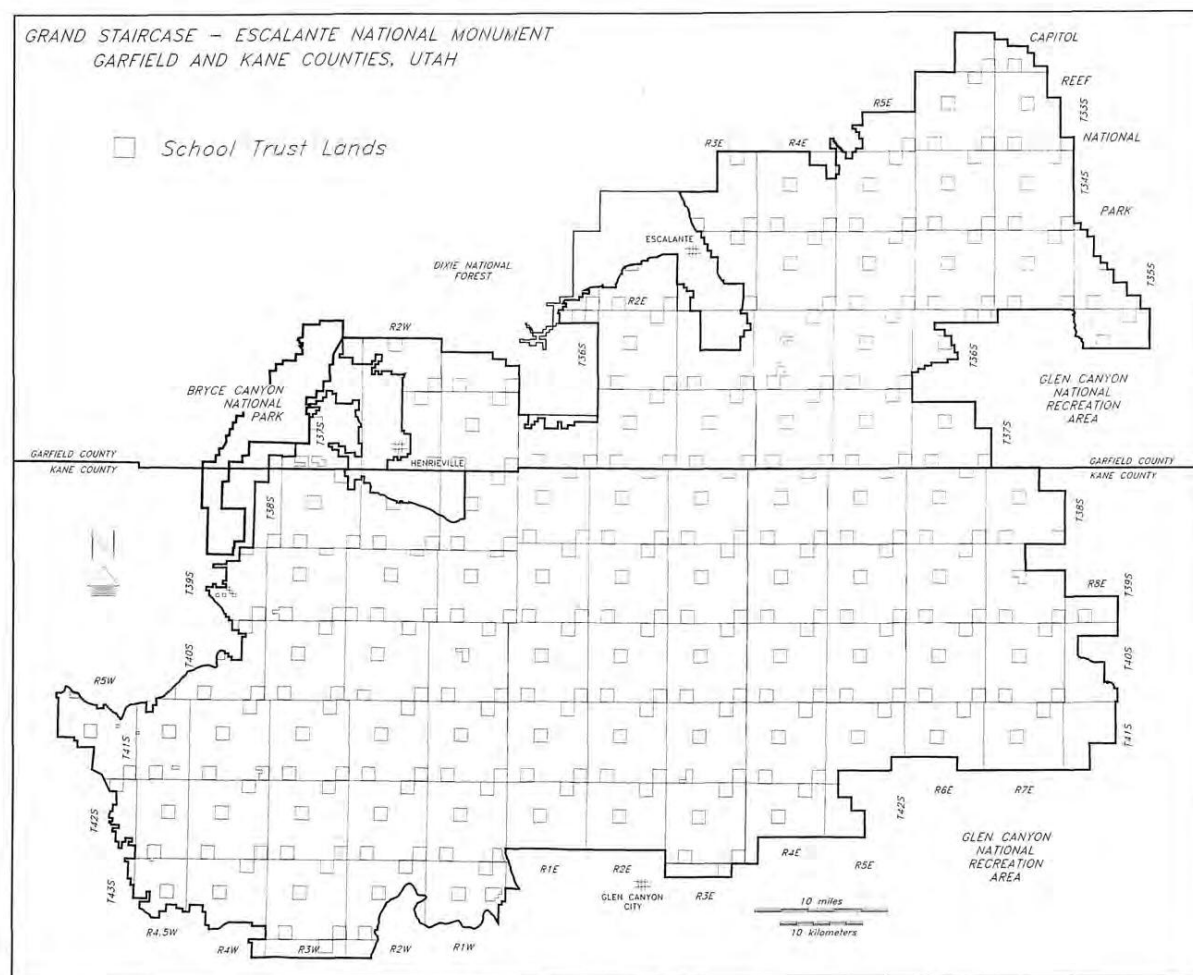
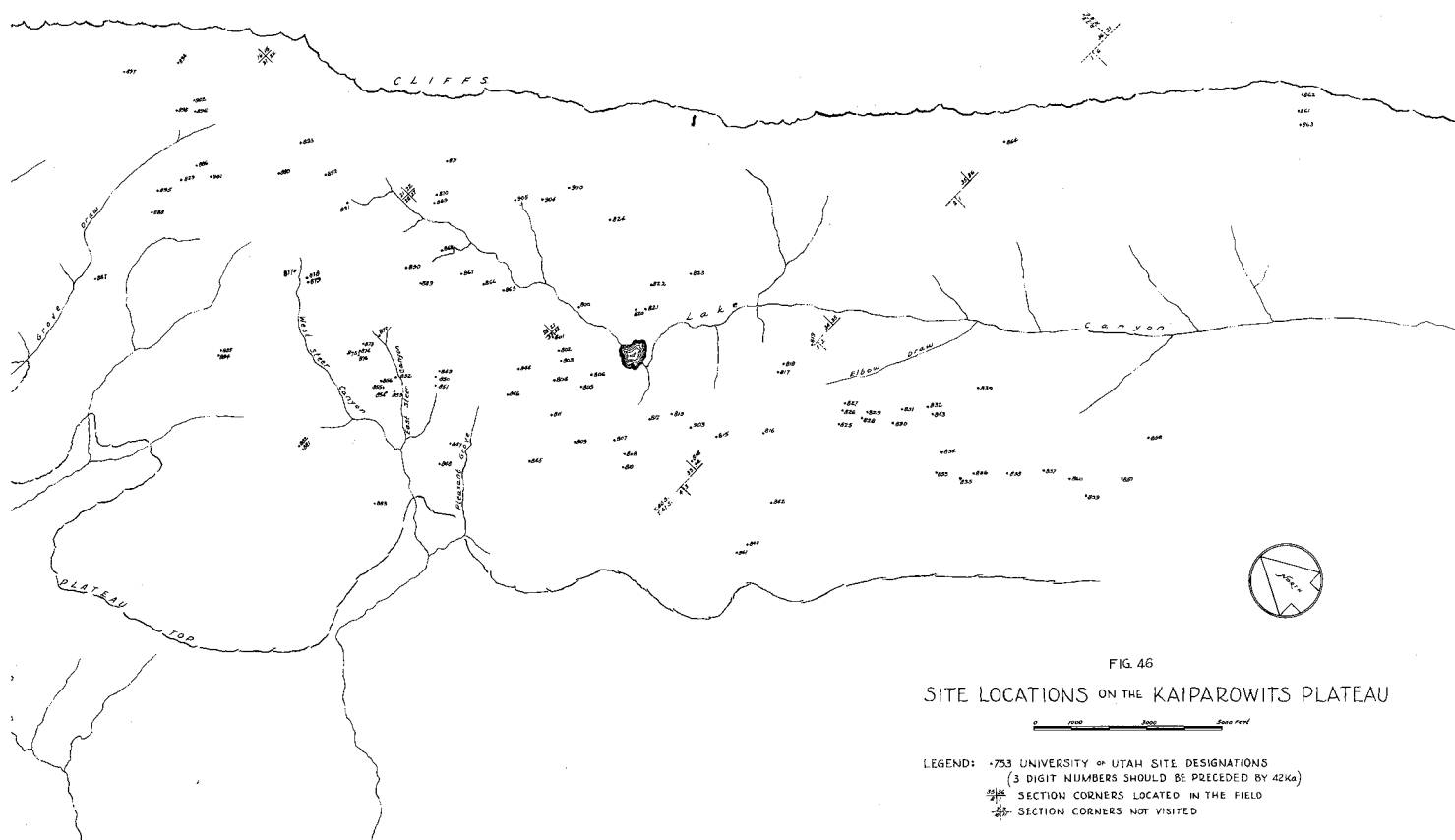


Figure 2. Location of School and Institutional Trust Lands within the Grand Staircase-Escalante National Monument.

1959 Map of Selected Archaeological Resources Located on the Kaiparowits Plateau

ARCHEOLOGICAL SURVEY OF THE
KAIPAROWITS PLATEAU

James H. Gunnerson



1961 Map of Selected Archaeological Resources Located on the Kaiparowits Plateau

1961 EXCAVATIONS
KAIPAROWITS PLATEAU, UTAH

by

Don D. Fowler and C. Melvin Aikens

with an appendix

by

C. Melvin Aikens

Number 66 (Glen Canyon Series Number 20) June 1963

ANTHROPOLOGICAL PAPERS

Department of Anthropology

University of Utah

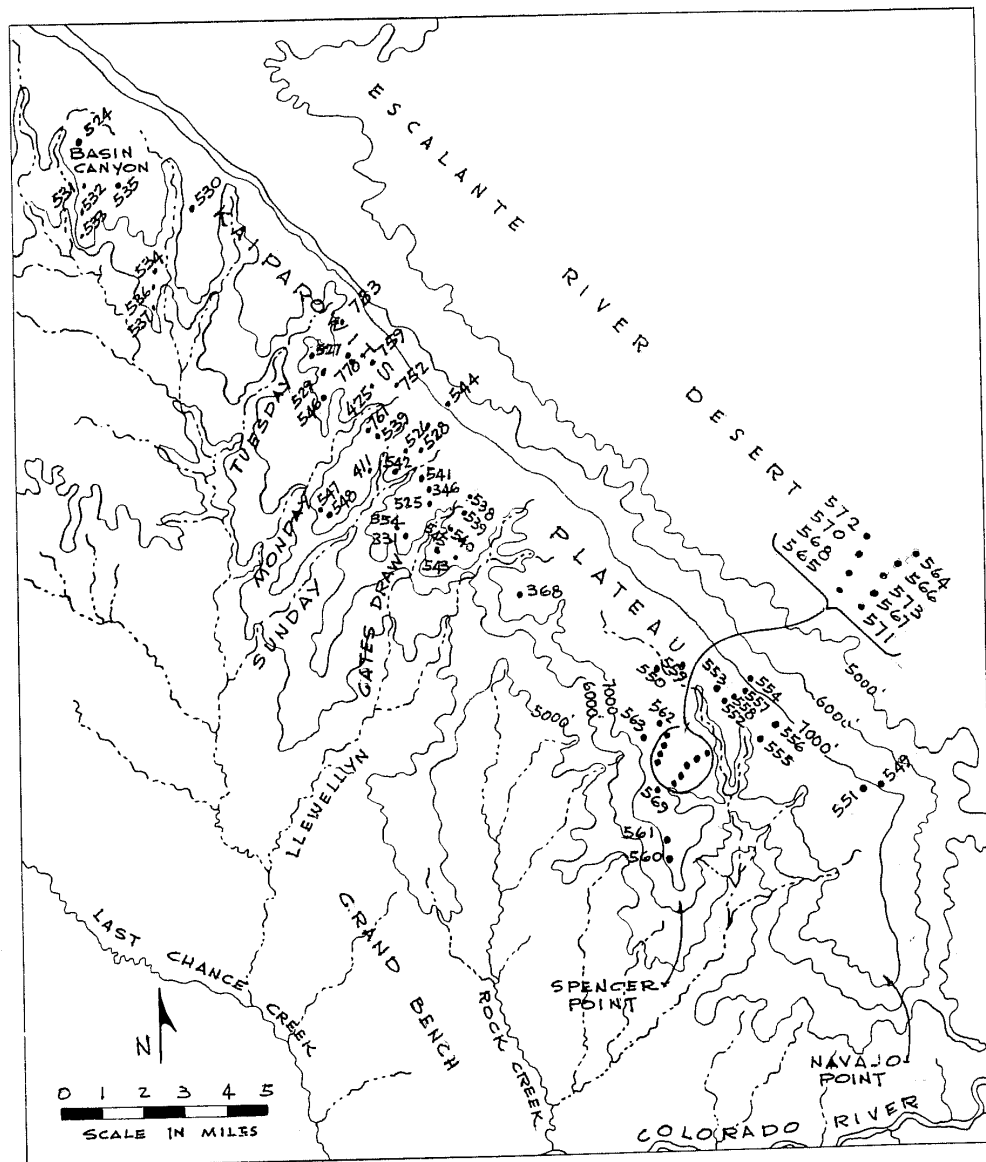


Fig. 1, b. Kaiparowits Plateau map showing site locations.

1964 Map Illustrating Interaction of Fremont
and Anasazi Cultures within the Monument
Area

KAIPAROWITS PLATEAU AND GLEN CANYON
PREHISTORY: An interpretation based on ceramics.

by
Florence C. Lister

Number 71

(Glen Canyon Series Number 23)

July 1964

ANTHROPOLOGICAL PAPERS

Department of Anthropology

University of Utah

viii

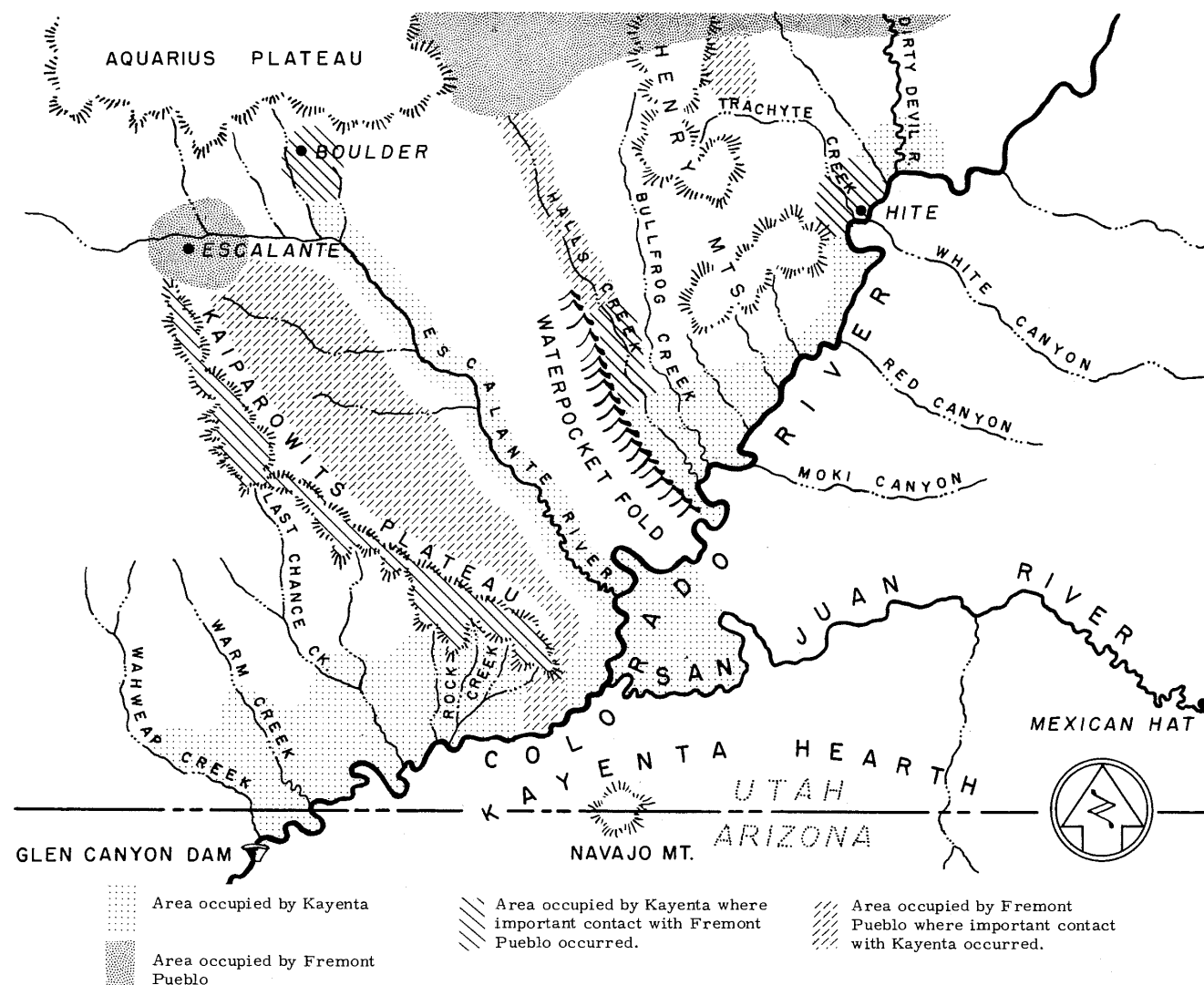


Fig. 1. Map of Kayenta and Fremont Pueblo occupation ca. A.D. 1100 as revealed by work of the Upper Colorado River Basin Archeological Salvage Project.